OLYMPUS®

MAINTENANCE MANUAL

UES-40

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INTRODUCTION

Repair and maintenance of this product requires highly specialized knowledge and techniques.
We recommend that you contact an Olympus service center in your area if a problem develops with the product.
If repairs or modifications are made by personnel not authorized by Olympus, the warranty is void, and Olympus shall not be liable for damage that occurs to or as a result of use of the modified product.

Applicable Unit

- ELECTROSURGICAL UNIT UES-40 120 V
- ELECTROSURGICAL UNIT UES-40 220 V

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1. Outline

The ELECTROSURGICAL UNIT UES-40 (UES-40) is designed for use in medical facilities under doctor supervision in combination with designated reusable high-frequency instruments, endoscopes, and light sources in surgical procedures and treatment using endoscopes (fiber scopes, videoscopes, and rigid scopes) for the cutting and coagulation of living tissue.

(1) Expanding the functions available with the UES-30
The UES-40 also offers an output system for use in physiological saline (TURis). TURis frees surgeons from the need for a patient plate, and offers improved safety over conventional TUR is.

TURis (TUR in saline): A technique for cutting and ablation in physiological saline

TUR: Transurethral resection of the prostate

(2) Supports the use of multiple electrodes
(Separate settings can be used for each system: bipolar, monopolar, and saline.)

(3) The UES-40 features exclusive specifications and is compatible with EndoALPHA.

(4) For easier use, the front panel is designed at a 20° vertical orientation.

(5) The design of the UES-40 is coordinated with the VISERA Video System.

2. Specifications

2-1 High-frequency output

2-1-1 Output methods

- Bipolar system
- Monopolar system
- Saline system

2-1-2 Options

- Bipolar system
  Cutting Mode: 1 option (Cut)
  Coagulation Mode: 3 options (Soft 1, Soft 2, Hard)
- Monopolar system
  Cutting Mode: 3 options (Pure, Blend, Uro)
  Coagulation Mode: 3 options (Coag 1, Coag 2, Spray)

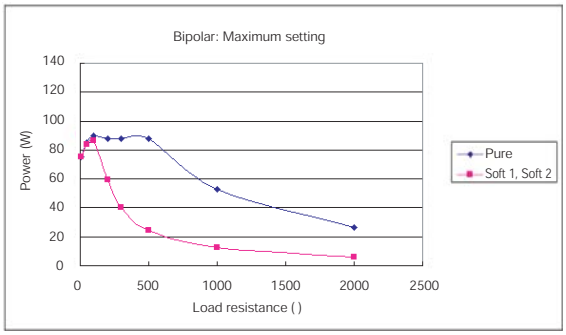
- Saline system
  Cutting Mode: 2 options (Pure, Blend)
  Coagulation Mode: 2 options (Coag 1, Coag 2)

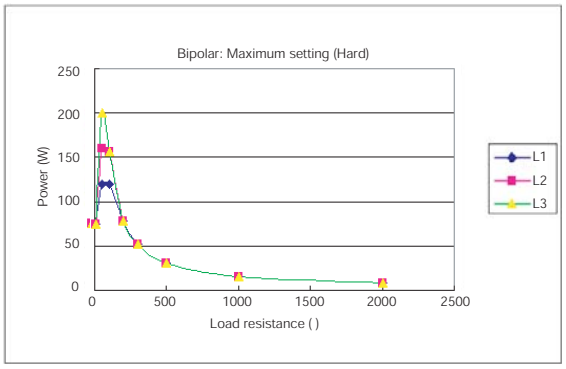
2-1-3 Basic frequencies

350 kHz, 1 MHz (when using Spray)

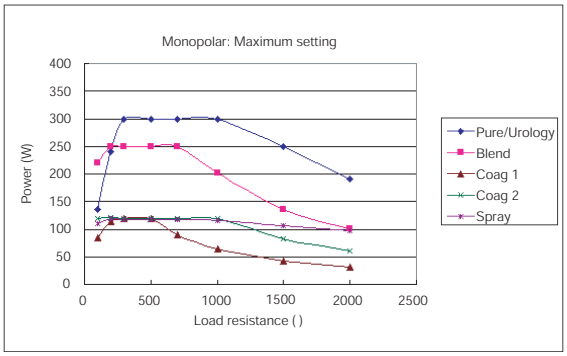
2-1-4 Output characteristics

- Bipolar system

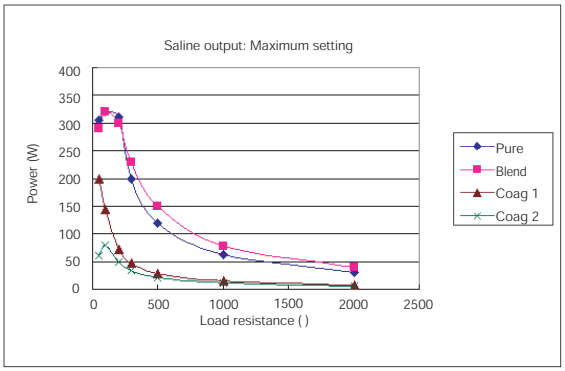




- Monopolar system



- Saline system



2-1-5 Maximum values

- Bipolar system
  Cut: 90 W; Soft 1: 90 W; Soft 2: 90 W; Hard: L3
- Monopolar system
  Pure: 300 W; Blend: 250 W; Uro: 300 W; Coag 1: 120 W; Coag 2: 120 W; Spray: 120 W
- Saline system
  Pure: 320 W; Blend: 320 W; Coag 1: 200 W; Coag 2: 80 W

2-1-6 Adjustment increments

- Bipolar system
  0 to 20 W: 1-W increments; 20 W to 30 W: 2-W increments; 30 W and over: 5-W increments
  (Hard is adjustable in 1-level increments.)
- Monopolar system
  5-W increments
- Saline system
  5-W increments

2-1-7 Control switches

l Foot switch for UES-40 (MAJ-1258)
Controls the high-frequency output of monopolar and bipolar instruments (ON/OFF)

l Bipolar foot switch for UES-40 (MAJ-1259)
Controls the high-frequency output of bipolar instruments (ON/OFF)

l Handpiece output switch
Controls the high-frequency output of the handpiece (ON/OFF)

2-1-8 Output terminals

- Bipolar system
  Bipolar cord port 2 ports
- Monopolar system
  Active port 1 port
  Handpiece port 2 ports
- Saline system
  Dedicated cord port 1 port

Different control systems are available, depending on the output terminal. The output terminals and their corresponding controls are listed below.

System	Output terminal	Output option	Control system	Remarks
Bipolar	Bipolar 1 port	Coag, Cut	Foot switch for UES-40 (MAJ-1258)	Bipolar output can be selected using the Foot-switch select switch.
	Bipolar 2 port	Coag only	Bipolar foot switch for UES-40 (MAJ-1259)	
Saline	Saline port	Coag, Cut	MAJ-1258	The saline port detects the saline cable to be connected and the output terminal is automatically selected.
Monopolar	Handpiece 1 port	Coag, Cut	MAJ-1258 handpiece	Monopolar output can be selected using the Foot-switch select switch (except during control using the handpiece)
	Active port	Coag, Cut	MAJ-1258	
	Handpiece 2 port	Coag, Cut	Handpiece	

2-1-9 Recommended timing

Output (ON) timing: within 10 seconds; output stop (OFF): 30 seconds or more

2-2 Safety functions

2-2-1 Patient-plate monitor (for monopolar systems only)

Detects connection problems or disconnection of the single type patient plate, as well as loosening of split type patient plates. If problems are detected, the following operations are performed.

- Warning indicator is lit.
- Error code is displayed on output indicator.
- Audible warning is issued.
- High-frequency output is stopped.

2-2-2 High-frequency-output monitor

Detects whether the output value is correct for the output setting value. If problems are detected, the following operations are performed.

- Error code is displayed on output indicator.
- Audible warning is issued.
- High-frequency output is stopped.

2-2-3 Output timing monitor (for monopolar or saline systems only)

Detects the high-frequency output timing. If output continues for more than 60 seconds, the following operations are performed.

- Error code is displayed on output indicator.
- Audible warning is issued.
- High-frequency output is stopped.

2-2-4 Self-check monitor

Verifies the correct operation of all safety functions. If problems are detected, the following operations are performed.

- Error code is displayed on output indicator.
- Audible warning is issued.
- Various settings are disabled.
- High-frequency output is stopped.

2-2-5 Control switch monitor

Detects short-circuits of each switch (foot switch and handpiece). If problems are detected, the following operations are performed.

- Error code is displayed on output indicator.
- Audible warning is issued.
- Various settings are disabled.
- High-frequency output is stopped.

2-3 Additional features

2-3-1 Preset function

Use of the preset function enables the most-recently used output setting, as well as up to five configurations of preset user settings, to be stored for future use.

2-3-2 CQM function

When split type patient plates are attached, the CQM indicator lights up when there is a good connection with the patient.

2-4 Safety

2-4-1 Medical electrical-equipment classifications

- Protection against electrical shock
  Class-I equipment (three-prong plug for power supply)
- Level of electrical-shock protection
  CF-type (low-frequency leakage current of 10µþA or less)
- Level of explosion protection
  Never use the UES-40 where flammable vapors occur.
- Others
  Defibrillator protection

2-5 Laws, regulations, and standards

Region / country	Applicable laws and regulations / external standards
EU/EFTA	MDD Classification: IIb CE marking: CE0197
U.S.	UL mark
Other areas	None

2-6 Others

- Dimensions
  350 mm (W) ¥ 400 mm (D) ¥ 150 mm (H)
- Weight
  12 kg

3. Operating Requirements

(1) The operating conditions must be as follows.
Ambient temperature: 10°C to 40°C
Relative humidity: 30% to 85%
Atmospheric pressure: 700 hPa to 1060 hPa
Never use the UES-40 where flammable vapors occur.

(2) The power requirements are as follows.

Rated input voltage	120 V	220 V
Rated input current	12A	6A
Frequency	50/60 Hz	
Permissible voltage fluctuation	±10%	

(3) Do not use in combination with products not designated by Olympus.

(4) Before using the UES-40 for the treatment of patients wearing pacemakers, consult the pacemaker manufacturer.

(5) Do not attach the patient plate for use near metallic implants.

(6) Do not wind UES-40 cords into loops or allow them to touch the patient or metallic parts of the surgical table.

(7) Do not bundle UES-40 cords with cords of other medical equipment during use.

(8) Keep the UES-40 and its cords adequately separated from other medical equipment and cords.

(9) If non-CF products are used in combination with the UES-40, do not use directly on the heart.

(10) To ensure electrical safety, use of the following electronic medical equipment in combination with the UES-40 is prohibited:

a) Equipment not yet proven safe when used with the UES-40

b) Equipment not yet proven safe due to certain aspects of operation (such as the leakage current)

(11) If the UES-40 is used in combination with endoscopic instruments for which the rated voltage is listed in each instrument user manual, compare the open output-voltage characteristics of the instruments with those of the UES-40 and adjust the output within the USE-40's rated voltage values. Refer to Fig. 1-1 to 1-4 for the open voltage characteristics. If the user's manuals for these instruments do not list the rated voltage, set the output low initially and then gradually increase the output level.

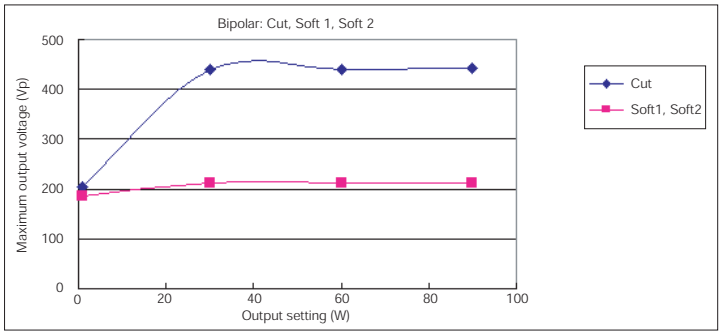


Figure 1-1 Open voltage characteristics (Bipolar: Pure, Soft 1, Soft 2)

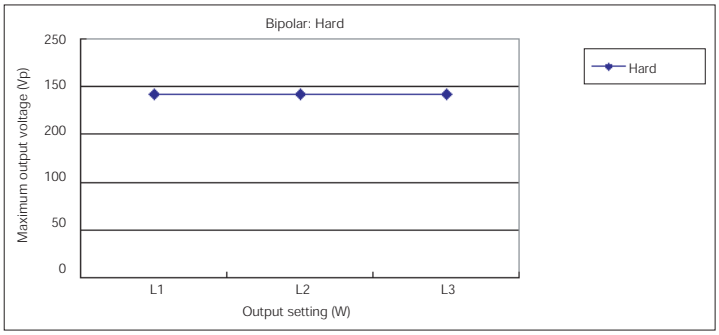


Figure 1-2 Open voltage characteristics (Bipolar: Hard)

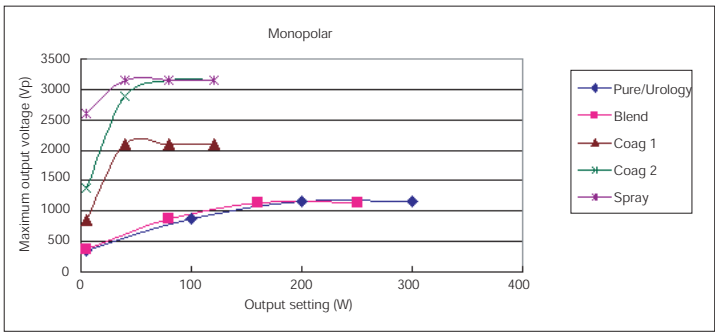


Figure 1-3 Open voltage characteristics (Monopolar)

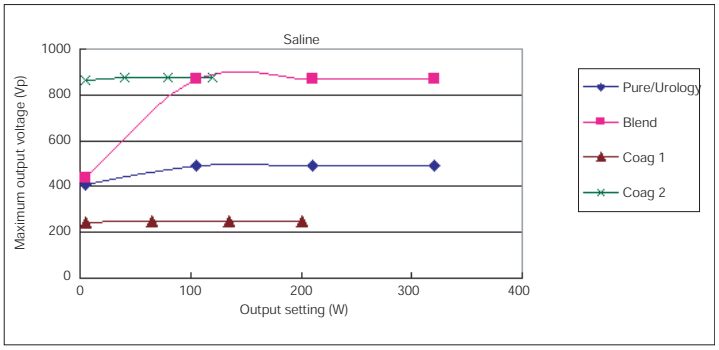
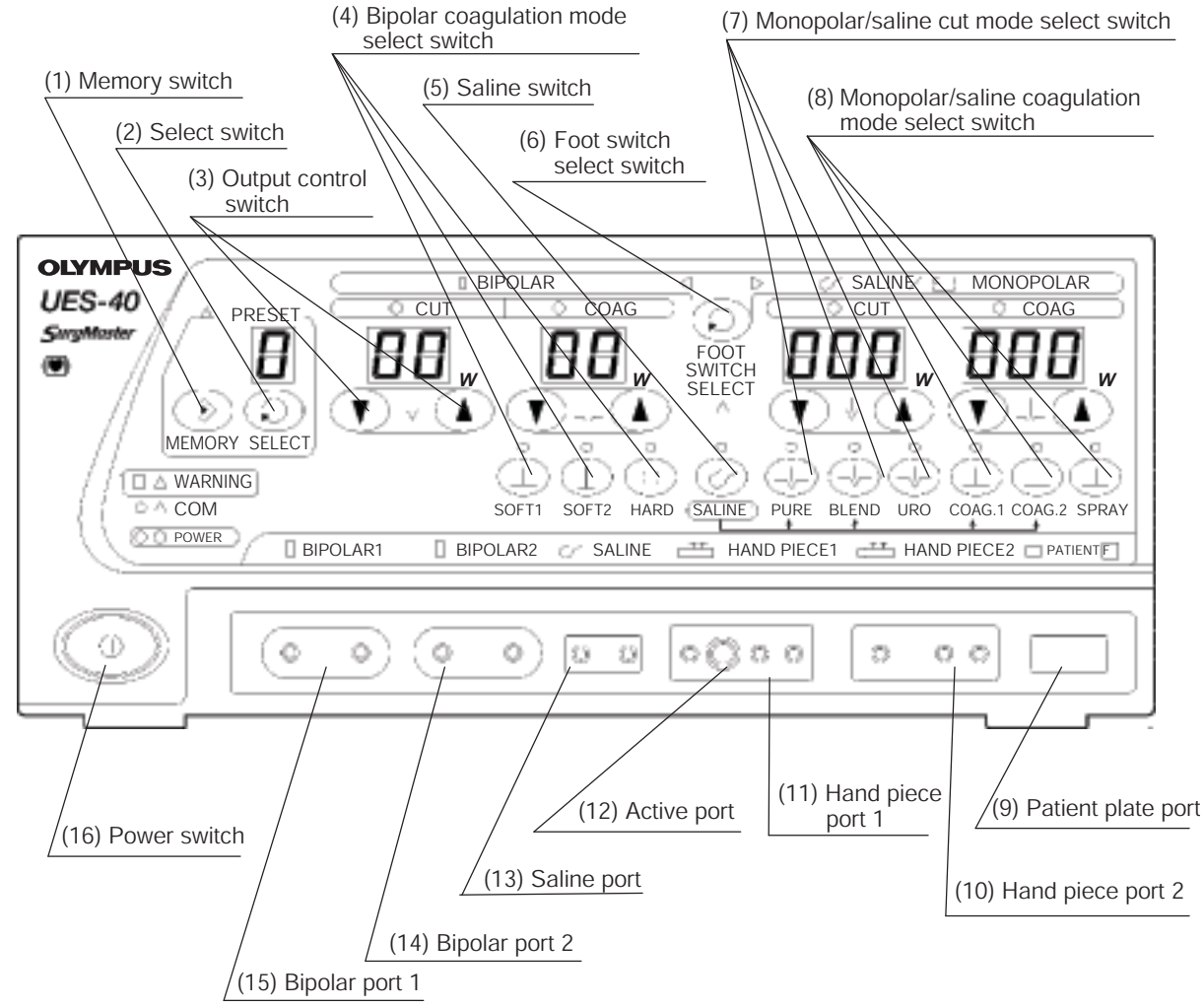


Figure 1-4 Open voltage characteristics (Saline)

4. Name and Function of Each Part

4-1 Front panel (for 120 V and 220 V)

4-1-1 Switches and ports



(1) Memory switch
This switch is used to store output settings and modes that have been previously set.

(2) Select switch
This switch is used to recall stored output settings and modes.

(3) Output control switches
To increase the displayed setting value, press s. To decrease it, press t.

(4) Bipolar coagulation mode select switches
These switches are used to select bipolar coagulation modes.

(5) Saline switch
This switch is used to select the saline mode.

(6) Foot-switch select switch
This switch is used to switch between the saline/monopolar mode and the bipolar output mode.

(7) Monopolar/saline cut mode select switches
These switches are used to select the monopolar and saline cut mode

(8) Monopolar/saline coagulation mode select switches
These switches are used to select the monopolar and saline coagulation mode.

(9) Patient-plate port
This port is used for connection of the patient-plate plug.

(10) Handpiece port 2
This port is used for connection of a monopolar handpiece plug.

(11) Handpiece port 1
This port is used for connection of a monopolar handpiece plug.

(12) Active port
This port is used for the connection of the active electrode of the Active cord.

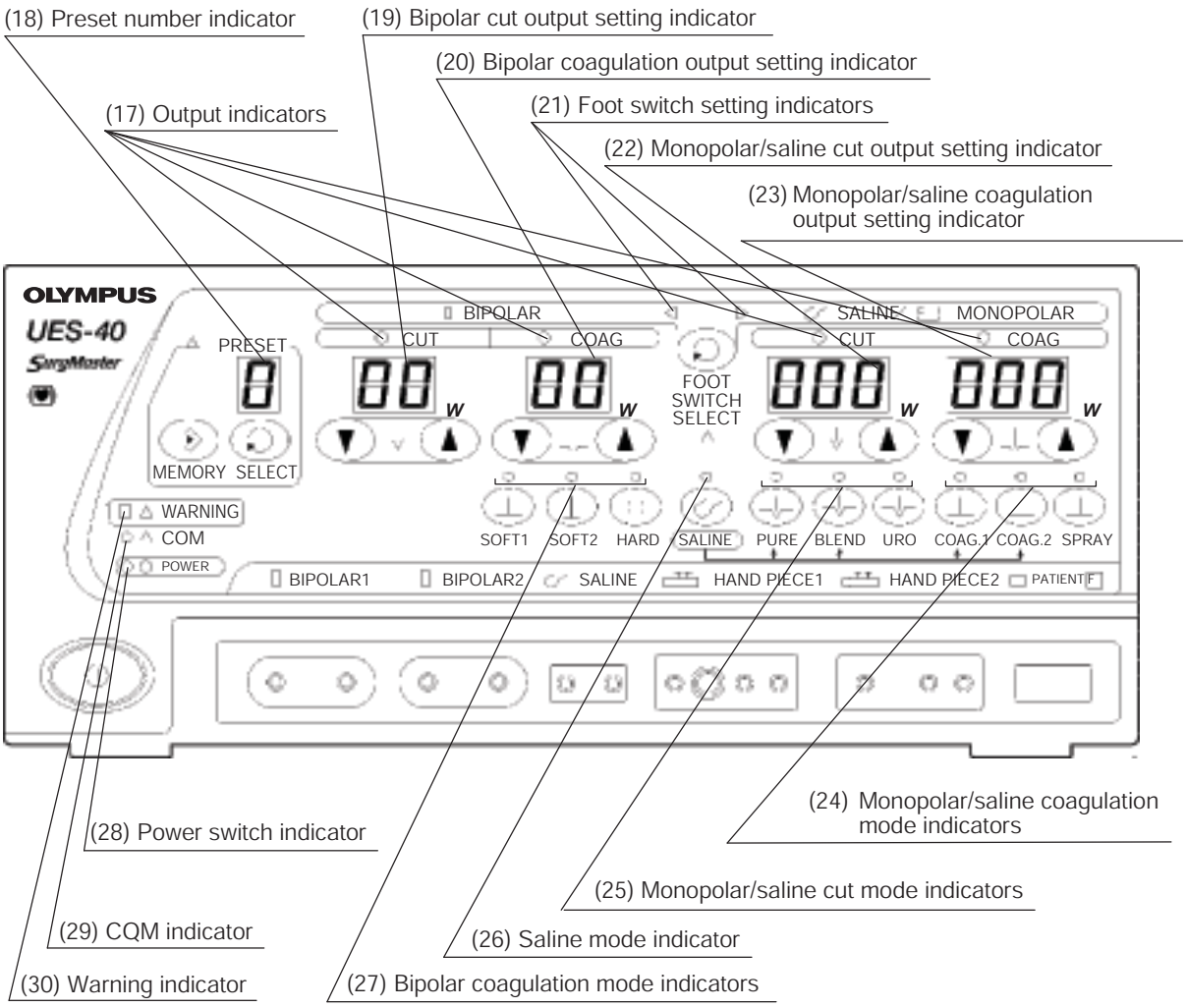
(13) Saline port
This port is used for connection of the saline code.

(14) Bipolar port 2
This port is used for connection of bipolar electrodes.

(15) Bipolar port 1
This port is used for connection of bipolar electrodes.

(16) Power switch
For turning the power on. When the power is turned on, the power switch indicator lights up.

4-1-2 Indicators



(17) Output indicators
During high-frequency output, the indicator corresponding to the selected output mode (Cut or Coag) lights up.

(18) Preset number indicator
During the use of preset functions, this indicator displays digits from 1 to 5 or P.

(19) Bipolar cut output setting indicator
This indicator displays the value specified using the output control switches.

(20) Bipolar coagulation output setting indicator
This indicator displays the value specified using the output control switches.

(21) Foot-switch setting indicator
This indicator displays the available output from the foot switch for the UES-40 (MAJ-1258).

(22) Monopolar/saline cut output setting indicator
This indicator displays the value specified using the output control switches.

(23) Monopolar/saline coagulation output setting indicator
This indicator displays the value specified using the output control switches.

(24) Monopolar/saline coagulation mode indicators
The lighted indicator corresponds to the coagulation mode selected using the switches.

(25) Monopolar/saline cut mode indicators
The lighted indicator corresponds to the cutting mode selected using the switches.

(26) Saline mode indicator
This indicator lights up when saline mode is selected using the switch.

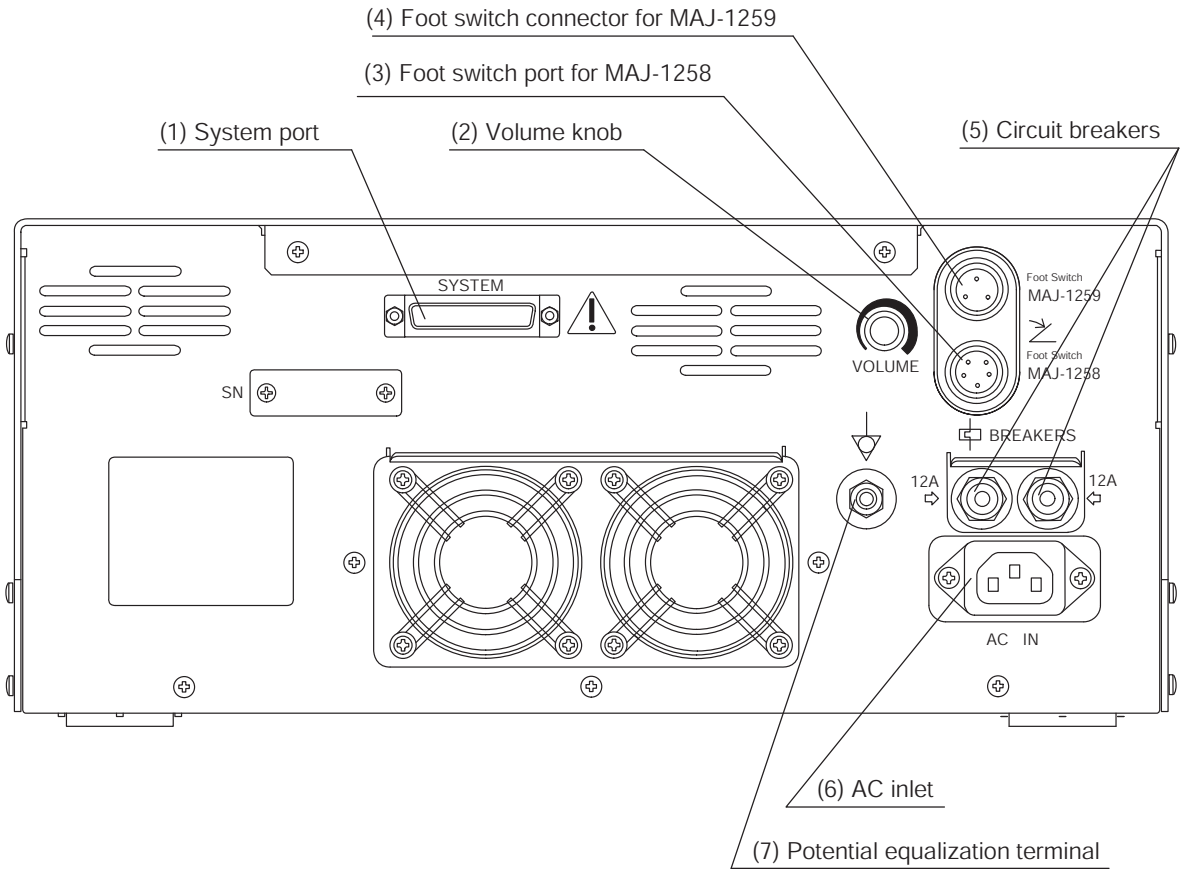
(27) Bipolar coagulation mode indicators
The lighted indicator corresponds to the coagulation mode selected using the switches.

(28) Power switch indicator
This indicator shows that the power is on after the power switch is activated.

(29) CQM indicator
When split type patient plates are attached, the CQM indicator lights up when there is a good connection with the patient.

(30) Warning indicator
This indicator lights up if equipment problems occur.

4-2 Rear panel



(1) System port
This system port is for connecting products to expand the functionality of the unit. Connect only Olympus products.

(2) Volume knob
This knob is for adjustment of the sound output.

(3) Foot switch port for MAJ-1258
This port is for connecting the standard accessory foot switch for UES-40.

(4) Foot switch port for MAJ-1259
This port is for connecting an optional bipolar foot switch for UES-40.

(5) Circuit breakers
These breakers are used in the event of mechanical problems to prevent electrical surges within the UES-40.

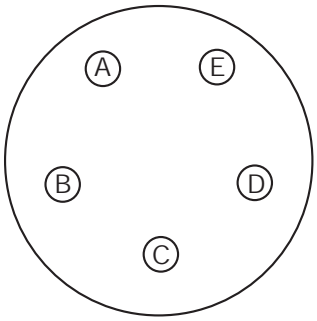
(6) AC inlet
This inlet is for connecting the power cord.

(7) Potential-equalization terminal
This terminal is connected for potential equalization.

5. Ports

5-1 Foot switch port for MAJ-1258

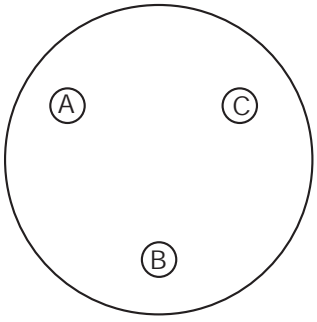
Pin No.	Signal
A	FS1CUT1
B	TS1COAG1
C	FS1PA1
D	GND
E	FS/MODE



As viewed from the connection side

5-2 Bipoler foot switch port for MAJ-1259

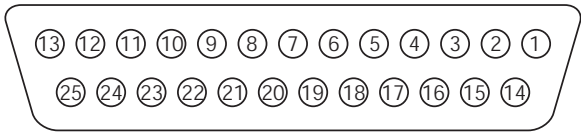
Pin No.	Signal
A	FS3COAG1
B	GND
C	NC



As viewed from the connection side

5-3 System port

Pin No.	Signal	Pin No.	Signal
1	NC	14	SG1
2	TxD1	15	NC
3	RxD1	16	NC
4	RTS1	17	NC
5	CTS1	18	NC
6	DSR1	19	NC
7	SG1	20	DTR1
8	NC	21	NC
9	NC	22	NC
10	NC	23	NC
11	NC	24	NC
12	NC	25	NC
13	SMKEVAC1		

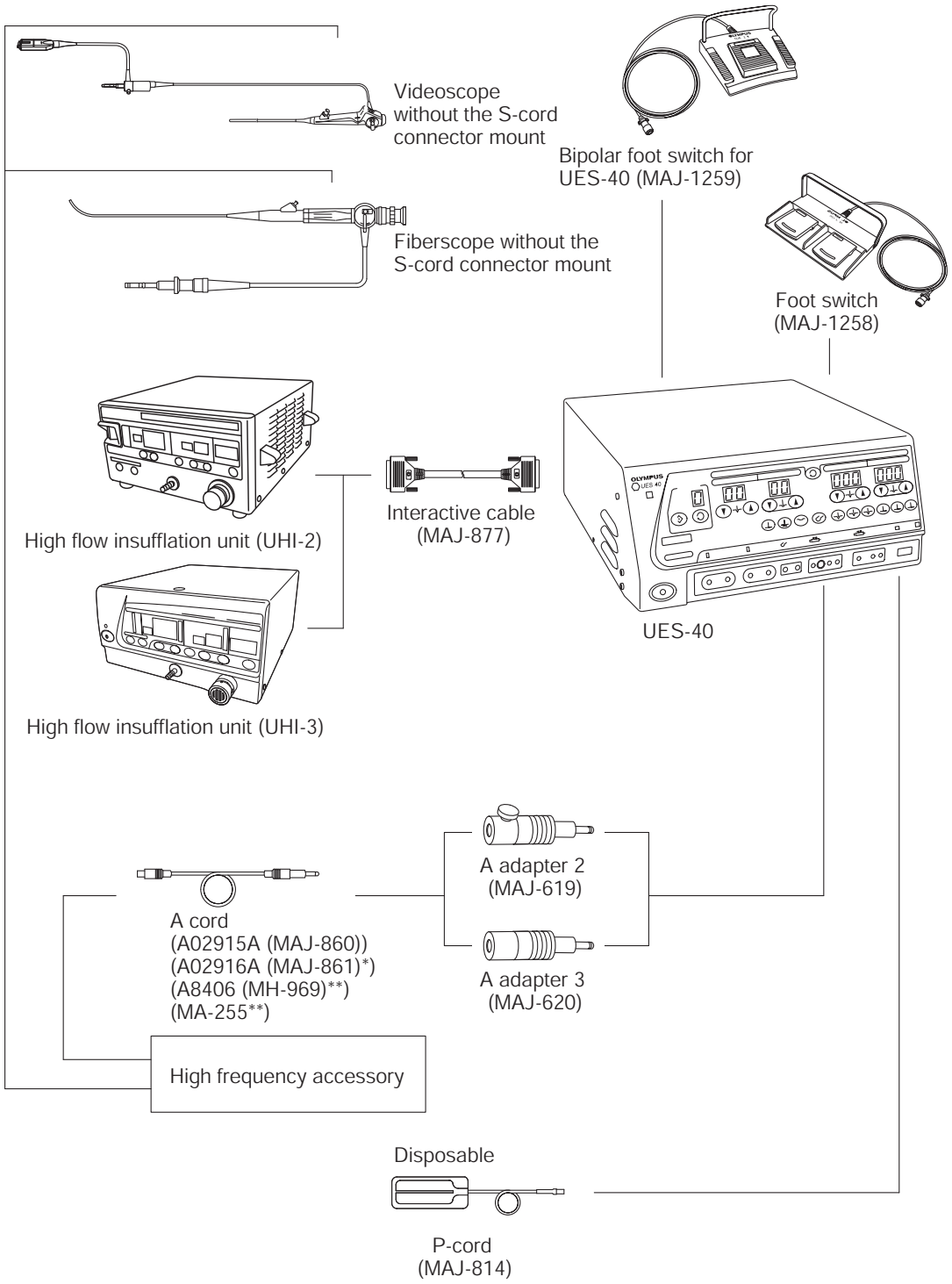


As viewed from the connection side

6. System Diagram

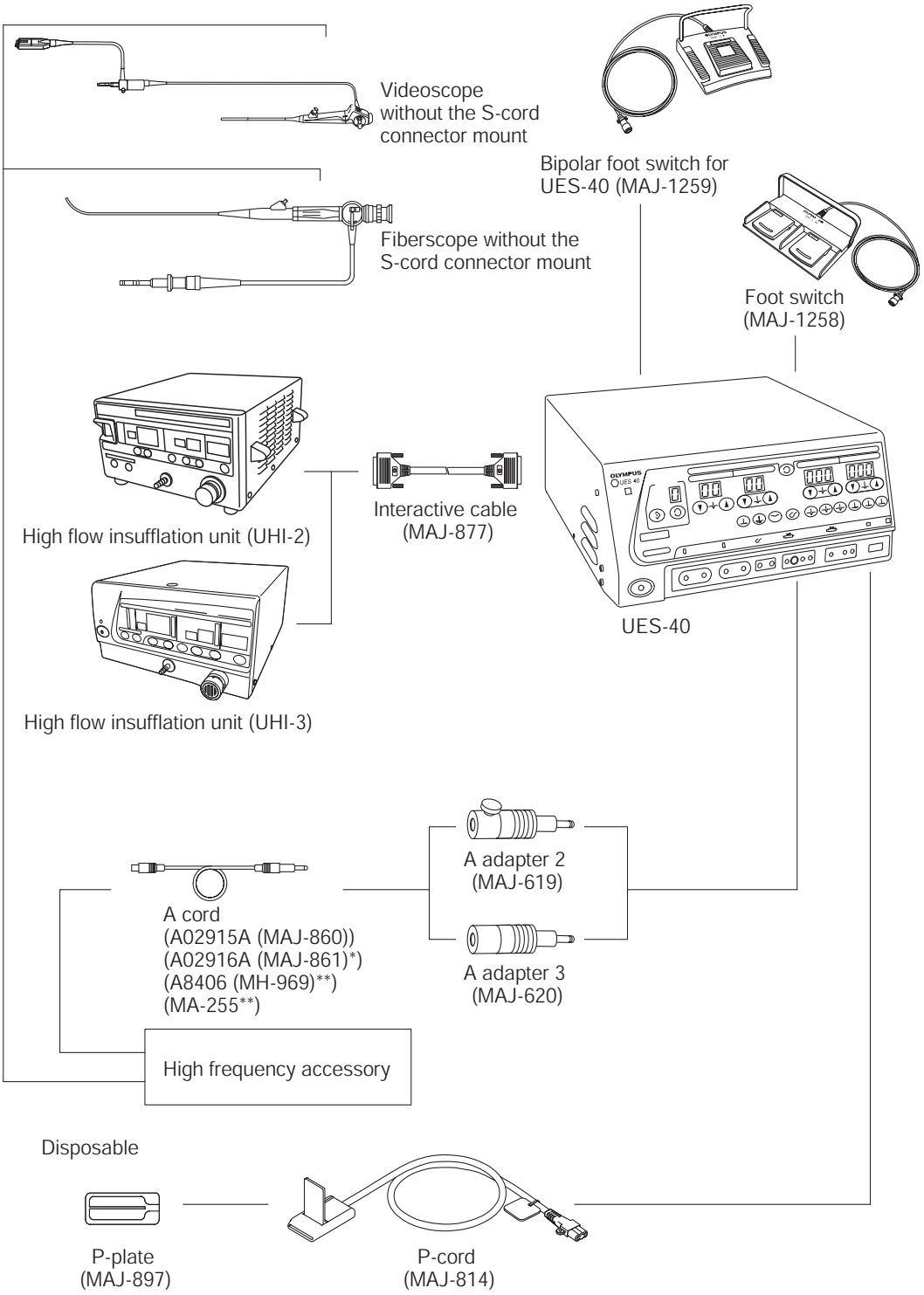
6-1 Endoscopic Treatment with UES-40 - System Diagram

l 120 V specification



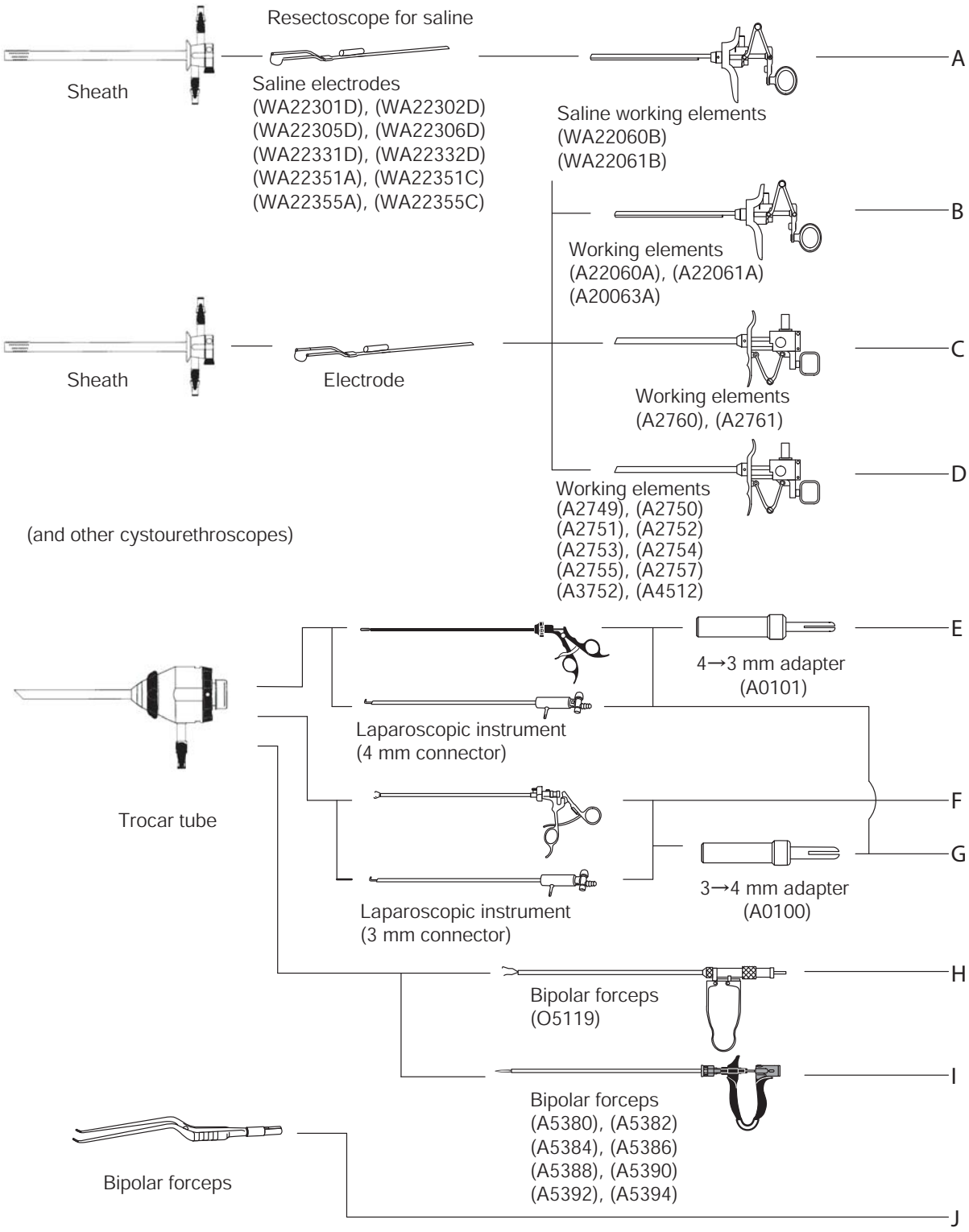
Some products may not be available in some regions. Please contact the nearest Olympus office for details
Specifications, design and accessories are subject to change without any notice or obligation on the part of the manufacturer.

l 220 V specification

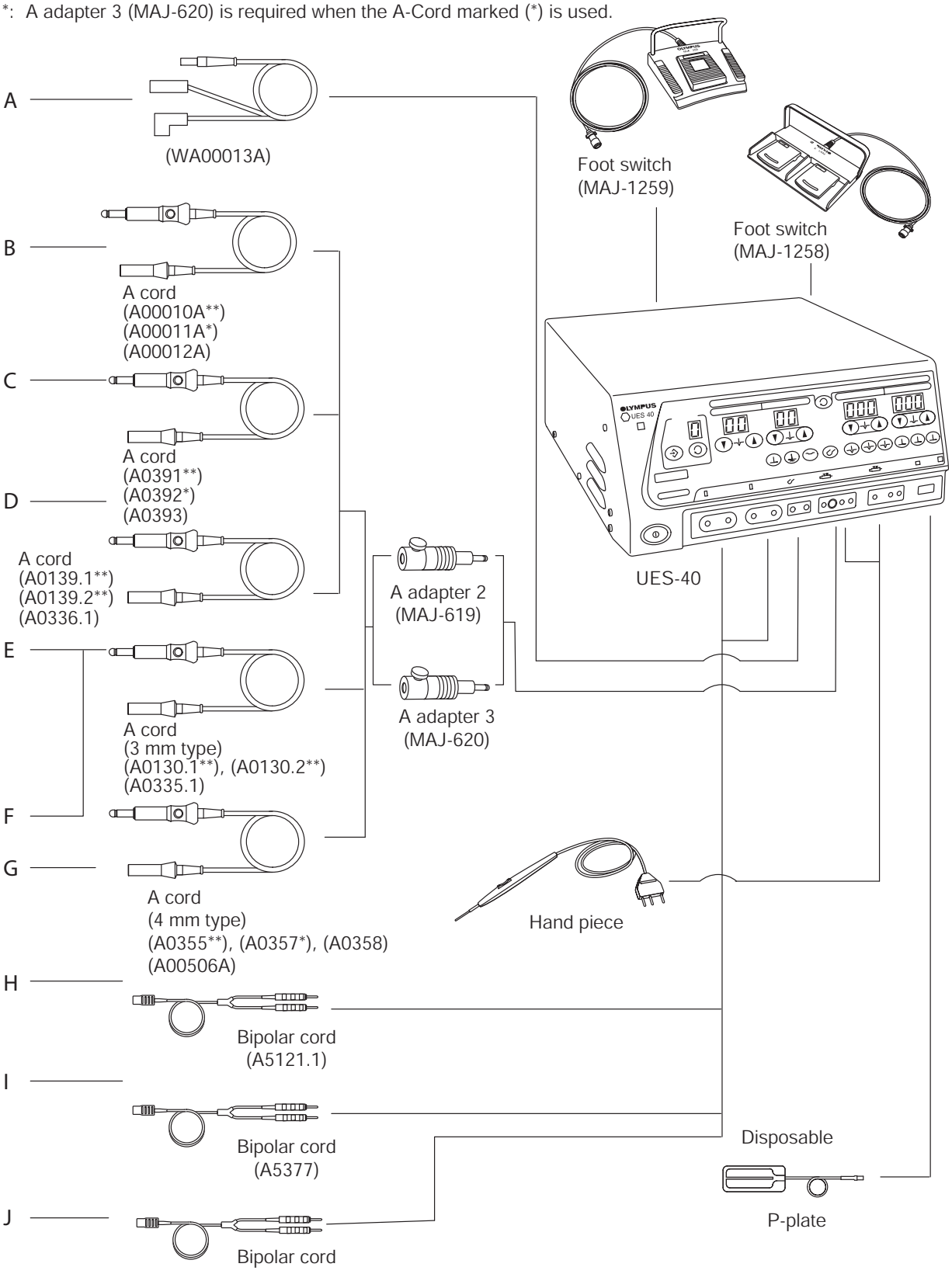


6-2 Electrosurgical Treatment with UES-40 - System Diagram

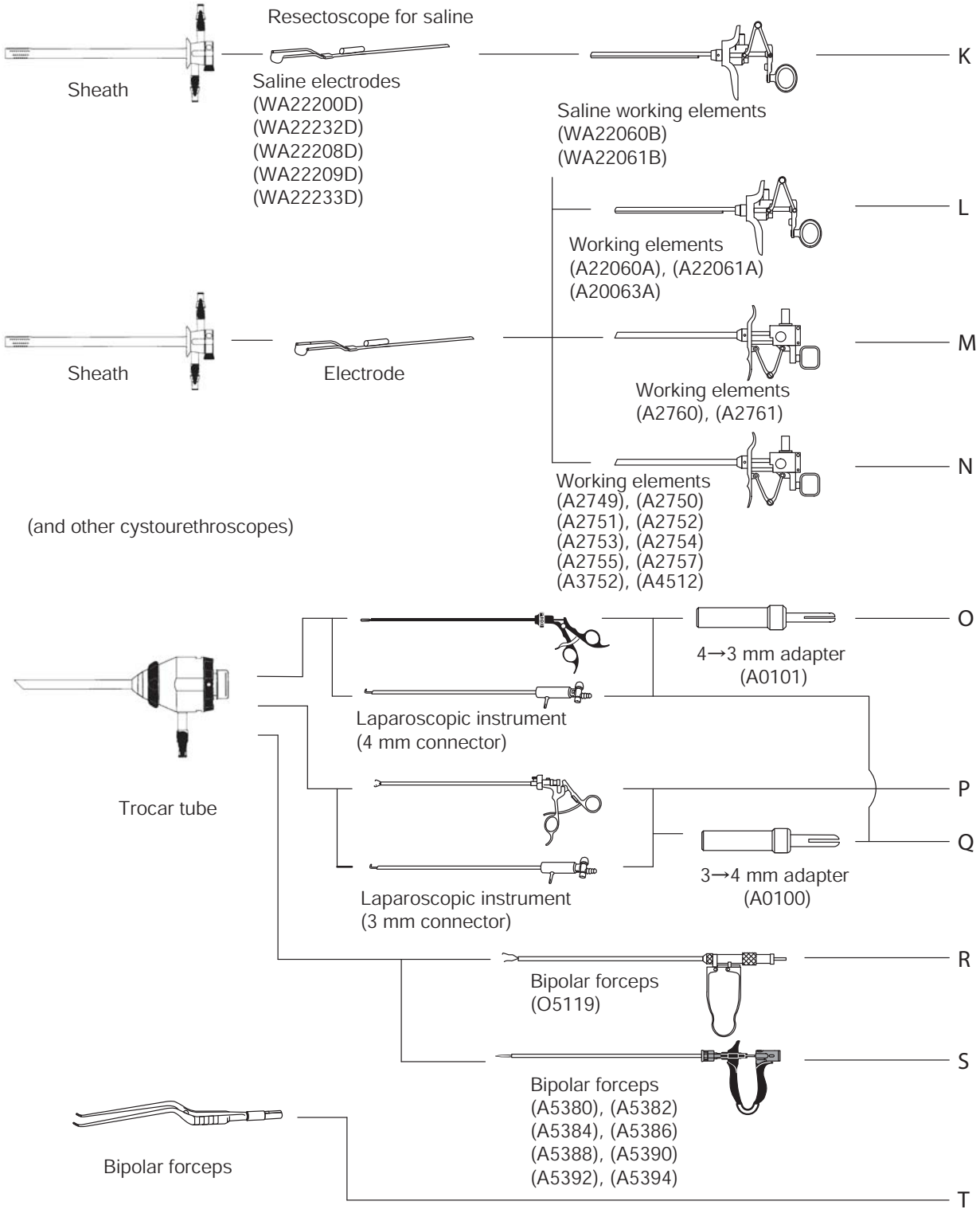
l 120 V specification



A adapter (MAJ-1) is not available in some countries.
**: A adapter 2 (MAJ-619) is required when the A-Cord marked (**) is used.
*: A adapter 3 (MAJ-620) is required when the A-Cord marked (*) is used.



l 220 V specification



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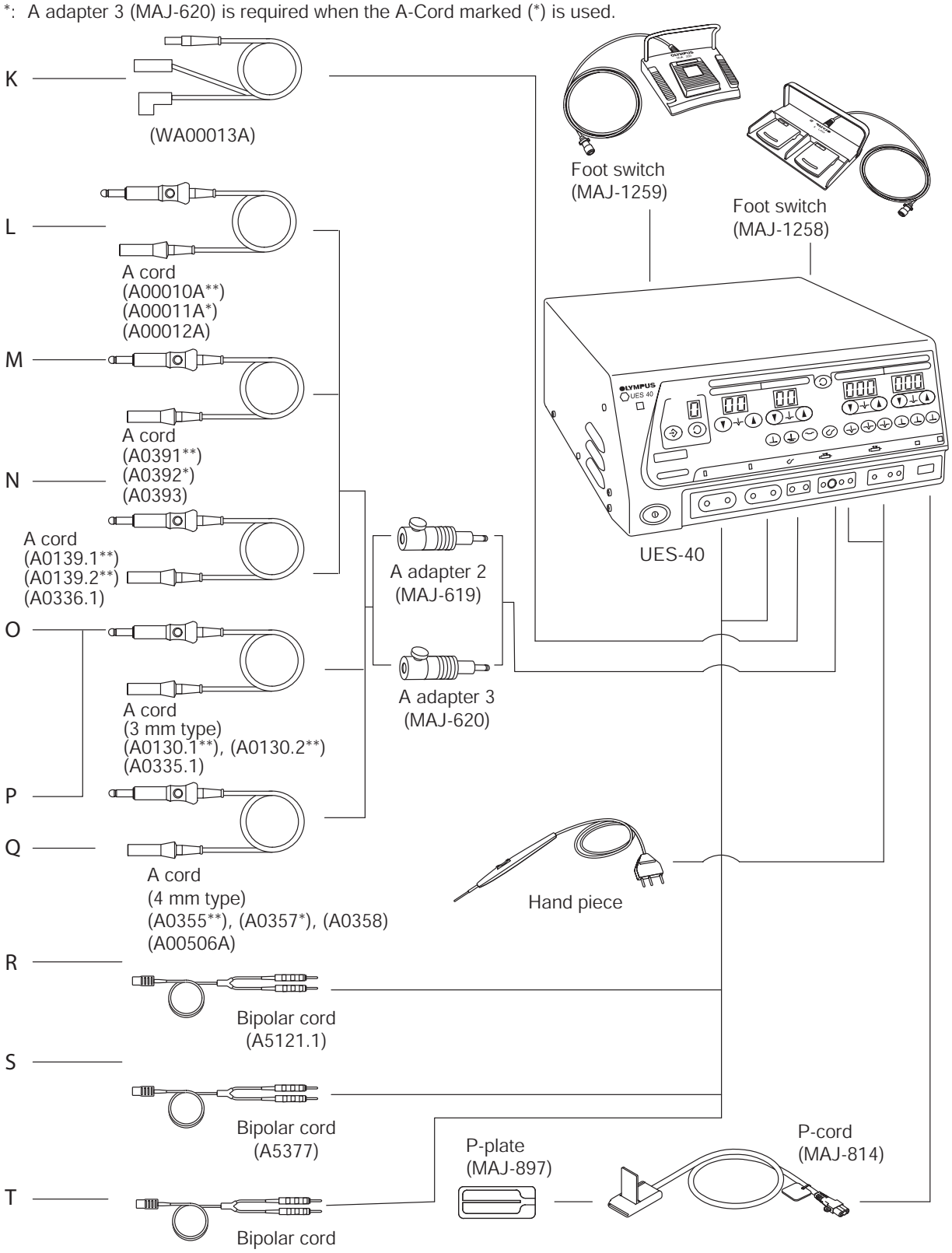
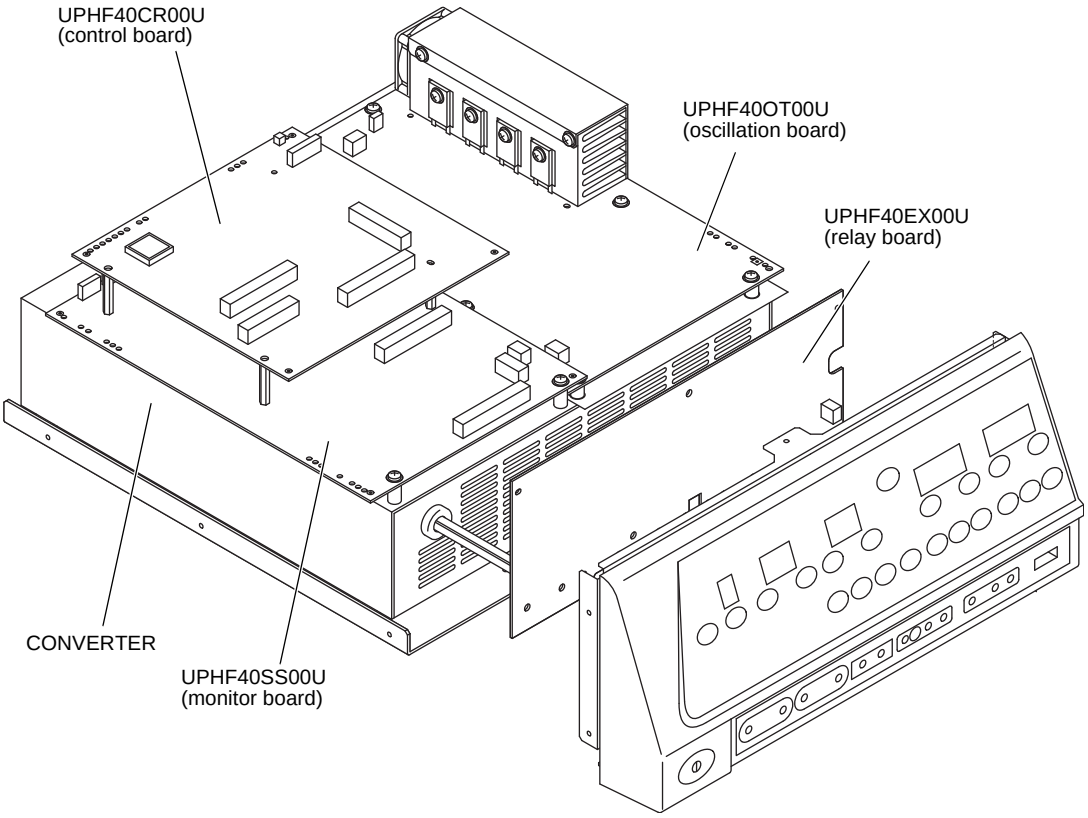


Chapter 2:Troubleshooting

1 Troubleshooting 2-2
2 Error Codes 2-7

1. Troubleshooting

Configuration of the main unit



Problem			*1 Oscillation board	Monitor board	Relay board	Control board	Panel sheet	Converter	Harnesses	Other	Other than main unit
Power-on problem	Converter fan unresponsive		—	—	—	—	—	1	Converter – Power switch	Power switch	—
	Power-switch LED remains unlit.		—	—	—	3	2	1	Converter – Oscillation board (J2)	Power switch	—
									Oscillation board (J4) – Control board (J5)		
									Control board (J2) – Panel sheet		
	No startup sound		—	2	—	1	—	3	Oscillation board (J3) – Monitor board (J5)	—	—
									Monitor board (J2) – Speaker		
									Monitor board (J16) – Control board (J1)		
	All panel lights remain unlit.		—	—	—	1	2	—	Control board (J2) – Panel sheet	—	—
	All panel lights remain lit.		—	—	—	1	2	—	—	—	—
No response even when the output switches*2 are pressed	All output switches including the handpiece and foot switch are unresponsive.	No sound	—	2	—	1	—	—	—	—	—
		LEDs remain unlit.	—	—	—	1	2	—	—	—	—
		No sound, LEDs remain unlit.	—	2	—	1	—	—	—	—	—
	Handpiece switch unresponsive (but foot switch works)	No sound	—	1	—	2	—	—	—	—	—
		LEDs remain unlit.	—	—	—	1	2	—	—	—	—
		No sound, LEDs remain unlit.	—	1	3	2	—	—	—	—	—
	Foot switch unresponsive (but handpiece switch works)	No sound	—	1	—	2	—	—	—	—	—
		LEDs remain unlit.	—	—	—	1	2	—	—	—	—
		No sound, LEDs remain unlit.	—	1	—	2	—	—	—	—	—
	Switch unresponsive when using handpiece connector 1	No sound	—	1	—	2	—	—	—	—	—
		LEDs remain unlit.	—	—	—	1	2	—	—	—	—
		No sound, LEDs remain unlit.	—	1	3	2	—	—	—	Front port part	Handpiece switch damage
	Switch unresponsive when using handpiece connector 2	No sound	—	1	—	2	—	—	—	—	—
		LEDs remain unlit.	—	—	—	1	2	—	—	—	—
		No sound, LEDs remain unlit.	—	1	3	2	—	—	—	Front port part	Handpiece switch damage
	Foot switch (MAJ-1258) unresponsive	No sound	—	1	—	2	—	—	—	—	—
		LEDs remain unlit.	—	—	—	1	2	—	—	—	—
		No sound, LEDs remain unlit.	—	1	3	2	—	—	Monitor board (J1) – Foot switch (MAJ-1258)	Foot switch (MAJ-1258) port part	Foot-switch damage
	Bipolar foot switch (MAJ-1259) unresponsive	No sound	—	1	—	2	—	—	—	—	—
		LEDs remain unlit.	—	—	—	1	2	—	—	—	—
		No sound, LEDs remain unlit.	—	1	3	2	—	—	Monitor board (J1) – Foot switch (MAJ-1259)	Foot switch (MAJ-1259) port part	Foot-switch damage

*1 The numbers indicate the relative likelihood that this is the affected unit. These numbered units may be damaged.

*2 Foot-switch cutting or coagulation pedal and handpiece output switch

(Continued next page)

Problem			Parts That Might Have Caused the Problem *1								
			Oscillation board	Monitor board	Relay board	Control board	Panel sheet	Converter	Harnesses	Other	Other than main unit
There is a response when the output switch is pressed, but it cannot be treated.	No output		1	2	4	3	—	5	Converter – Oscillation board (J1)	Front port part	—
									Monitor board (J3) – Oscillation board (J7)		
									Monitor board (J3) – Oscillation board (J3)		
									Oscillation board (J4) – Control board (J5)		
									Monitor board (J7) – Relay board (J2)		
									Monitor board (J5) – Relay board (J1)		
									Monitor board (J16) – Control board (J1)		
	Low output		2	1	4	3	—	5	Converter – Oscillation board (J5)	Front port part	—
									Oscillation board (J4) – Control board (J5)		
									Monitor board (J16) – Control board (J1)		
	High output		2	1	4	3	—	5	Oscillation board (J4) – Control board (J5)	—	—
									Monitor board (J16) – Control board (J1)		
	All normal		—	—	—	—	—	—	—	—	• Active cord disconnected • Incorrect use
Cannot be set up	Panel-switch problem	7-segment LED problem (cannot display correctly)	—	—	—	2	1	—	Control board (J2) – Panel sheet	—	—
		Switch unresponsive	—	—	—	2	1	—	Control board (J2) – Panel shee	—	—
		LEDs remain unlit.	—	—	—	2	1	—	Control board (J2) – Panel sheet	—	—
		Pressing the switch once gives a prolonged response	—	—	—	2	1	—	Control board (J2) – Panel sheet	—	—
		No sound	—	1	—	2	—	—	Monitor board (J2) – Speaker	Speaker	—
									Monitor board (J16) – Control board (J1)		
	Active cord (for saline) is not detected.	Even with the cord attached, saline mode is unavailable.	—	1	3	2	—	—	Monitor board (J5) – Relay board (J1)	Front port part	Active cord (for saline) connector is defined.
									Monitor board (J16) – Control board (J1)		
		Cord is not attached, but unit is in saline mode.	—	1	3	2	—	—	—	Front port part	—
		Removing the cord does not restore the mode.	—	1	3	2	—	—	—	Front port part	—

(Continued next page)

Problem		Parts That Might Have Caused the Problem								
		*1								
		Oscillation board	Monitor board	Relay board	Control board	Panel sheet	Converter	Harnesses	Other	Other than main unit
When used with the UHI, does not control smoke and cannot be linked	Does not function in a ganged manner	—	—	—	1	—	—	Control board (J6) – System port	System port part	• Smoke-controlling cable disconnected • Using an EndoALPHA communication cable • UHI not ready for smoke control • UHI main-unit damage
	Ganged when not switched ON	—	—	—	1	—	—	Control board (J6) – System port	System port part	• Use a cable other than the smoke-control cable or EndoALPHA communication cable • UHI main-unit damage
No communication with EndoALPHA	No communication	—	—	—	1	—	—	Control board (J6) – System port	System port part	• EndoALPHA communication cable disconnected • Using smoke-control cable • UCES damage
	Communication interruptions	—	—	—	1	—	—	Control board (J6) – System port	System port part	• EndoALPHA communication cable disconnected • UCES damage
Error code displayed	Patient-plate problem (Coag. 01)	4	1	3	2	—	—	Monitor board (J5) – Relay board (J1) Monitor board (J16) – Control board (J1)	Front connector part	• Patient-plate cord disconnected • Patient plate coming loose
	Solution detection problem (Coag. 02)	4	1	3	2	—	—	Converter – Oscillation board (J1) Converter – Oscillation board (J5) Monitor board (J3) – Oscillation board (J7) Monitor board (J6) – Oscillation board (J3) Oscillation board (J4) – Control board (J5) Monitor board (J7) – Relay board (J2) Monitor board (J5) – Relay board (J1) Monitor board (J16) – Control board (J1)	Front connector part	• Using a liquid other than saline (uromatic or the like) • Output in air
	Output timing problem (Coag. 04)	—	2	3	1	—	—	—	Foot switch (MAJ-1258) connector part	Monopolar output for more than 60 sec
	Output-switch problem (Coag. 08)	—	1	3	2	—	—	—	—	One of the output switches is broken.
	Output-switch ON problem (Coag. 10)	—	1	3	2	—	—	—	—	One of the output switches is broken.
	Short circuit of setting-switch (Coag. 20)	—	—	—	2	1	—	Control board (J2) – Panel sheet		

(Continued next page)

Problem		*1 Parts That Might Have Caused the Problem								
		Oscillation board	Monitor board	Relay board	Control board	Panel sheet	Converter	Harnesses	Other	Other than main unit
(From previous page) Error code displayed	High-frequency current monitor damage (Cut 01)	—	1	3	2	—	—	Monitor board (J7) – Relay board (J2) Monitor board (J16) – Control board (J1)	—	Used where the high-frequency current is prone to leakage. (Touching metal parts of patient's bed or objects such as external devices that have fallen to the ground; used simultaneously with high-frequency grounded electric scalpels [semi-floating], etc.)
	High-frequency voltage-monitor damage (Cut 02)	2	1	4	3	—	5	Converter – Oscillation board (J1) Converter – Oscillation board (J5) Monitor board (J3) – Oscillation board (J7) Monitor board (J6) – Oscillation board (J3) Oscillation board (J4) – Control board (J5) Monitor board (J7) – Relay board (J2) Monitor board (J16) – Control board (J1)	—	—
	Waveform-circuit damage (Cut 04)	—	—	—	1	—	—	—	—	—
	Converter (Power-supply) 1 damage (Cut 08)	3	—	—	1	—	2	Oscillation board (J4) – Control board (J5)	—	—
	Converter (Power-supply) 2 damage (Cut 10)	3	—	—	1	—	2	Oscillation board (J5) – Converter Oscillation board (J4) – Control board (J5)	—	—
	Converter (Power-supply) 3 damage (Cut 20)	3	—	—	1	—	2	Oscillation board (J5) – Converter Oscillation board (J4) – Control board (J5)	—	—
	Patient-plate-circuit damage (Cut 40)	—	1	3	2	—	—	Monitor board (J5) – Relay board (J1) Monitor board (J16) – Control board (J1)	—	—

2. Error Codes

2-1 Error-code list

Display location and error codes		Error Identification	Remarks
Monopolar cut output-setting indicator	**Monopolar coagulation output-setting indicator**		
—	01	Patient-plate problem	• Patient-plate cord is disconnected. • Improper patient-plate connection • Patient plate is disconnected.
—	02	Solution detection problem	• Output occurred without the use of saline • Output occurred when the electrode was not immersed in saline. • Active cord (for saline) is disconnected. • Active cord (for saline) is broken.
—	04	Output timing problem	Output for more than 60 sec (Only during monopolar or saline mode)
—	08	Output-switch problem	• Output level set to 0 W • Output switch damaged • Power was supplied while the output switch was pressed.
—	10	Output-switch ON problem	Multiple switches of the foot switch or handpiece were simultaneously pressed.
—	20	Short-circuit of setting switch	• Power was supplied while the front-panel switches were pressed. • A front-panel switch is damaged.
01	—	High-frequency current-monitor damage	
02	—	High-frequency voltage-monitor damage	
04	—	Waveform-circuit damage	
08	—	Converter (power supply)-1 damage	Overcurrent signal (converter)
10	—	Converter (power supply)-2 damage	Overvoltage signal (converter)
20	—	Converter (power supply)-3 damage	Temperature problem signal (converter)
40	—	Patient-plate circuit damage	

Chapter 3:Disassembly and Reassembly Procedure

1 Precautions for disassembly and reassembly..... 3-2
2 Disassembly procedure 3-3
3 Reassembly procedure 3-16

1. Precautions for disassembly and reassembly

(1) Keep all components safe, since you will need to reattach them at their original positions and reroute the cables as originally routed.

(2) Exercise extreme caution to prevent possible injuries during disassembly.
Be especially careful to avoid injuring yourself on the sharp edges of metal parts.

(3) Remove the cable housing carefully. Never detach cables by pulling on them.

(4) To ensure electrical safety in accordance with the governing electrical standards, attach the following in their original configurations when reassembling:

a) Insulators, such as insulating tubes and mylar sheets

b) Cables tied with binder to keep them from touching heat-generating and high-voltage components

c) Cover screws with toothed washers to reduce noise radiation

(5) Always use specified components.
The product is comprised of components designed to withstand anticipated vibration, heat, and voltage. When replacing any component, make sure that the replacement component has the same characteristics as the original component.

(6) Be sure to use the specified tightening torque and components of specified dimensions.

(7) Clean the components.
When reusing components, first remove any sealing tape and sealing compound, then clean them. Note that you must clean the surfaces of any O-rings and packings that will come in contact with components before use. Failure to do so may result in water leak against moisture or other problems.

(8) Check that all screws and nuts are properly tightened.
Failure to do so will result in water leak or other problems.

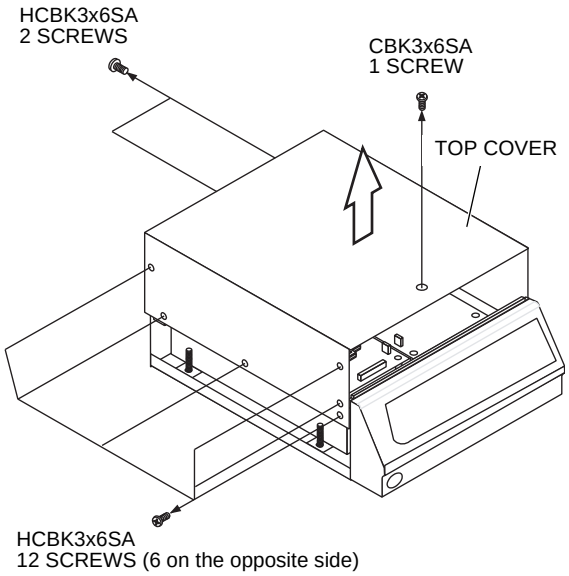
2. Disassembly procedure

2-1 Tools

No.	Name	Specifications	Remarks
1	Box screwdriver	5 mm between opposite sides	
2	Box screwdriver	5.5 mm between opposite sides	
3	Box screwdriver	8 mm between opposite sides	
4	Wrench	19 mm between opposite sides	
5	Neji-lock	1401C Red	
6	Phillips screwdriver	No.1	
7	Phillips screwdriver	No.2	

2-2 Disassembly procedure

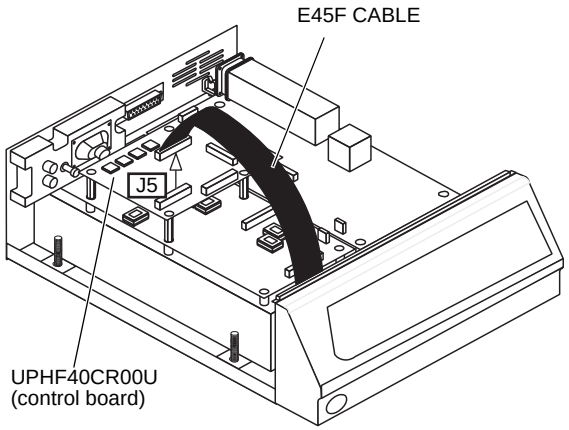
2-2-1 UES-40 main-unit disassembly



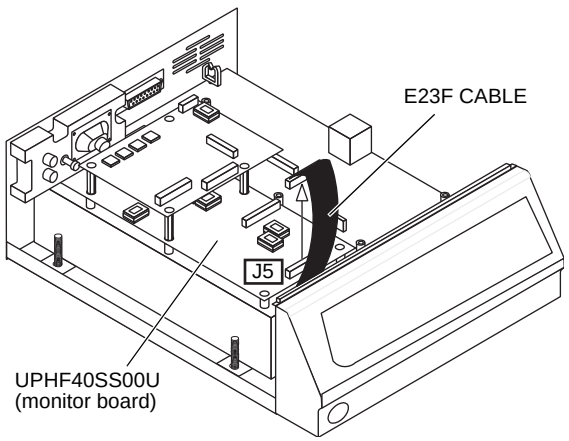
(1) Remove the 15 SCREWS holding the TOP COVER (HCBK3x6SA: 14 SCREWS; CBK3x6SA: 1 SCREW) and remove the TOP COVER.

Phillips screwdriver (No. 2)

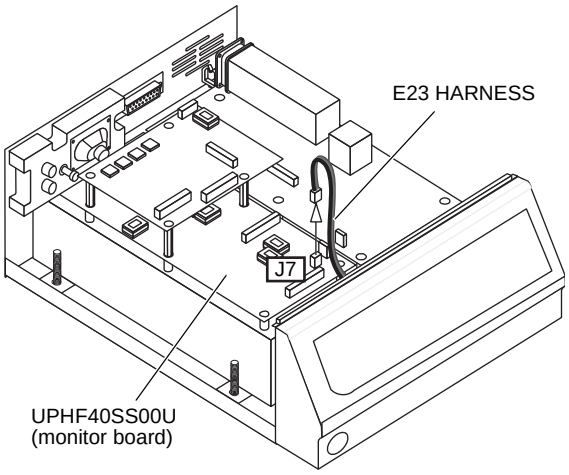
Note: During reassembly, make sure no CABLES are caught under the COVER.



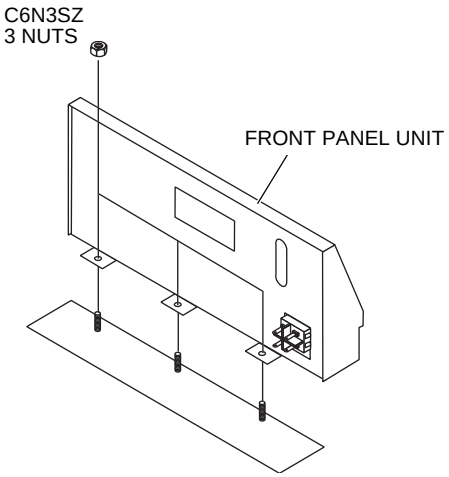
(2) Detach the E45F CABLE from J5 of UPHF40CR00U (control board).



(3) Detach the E23F CABLE from J5 of UPHF40SS00U (monitor board).

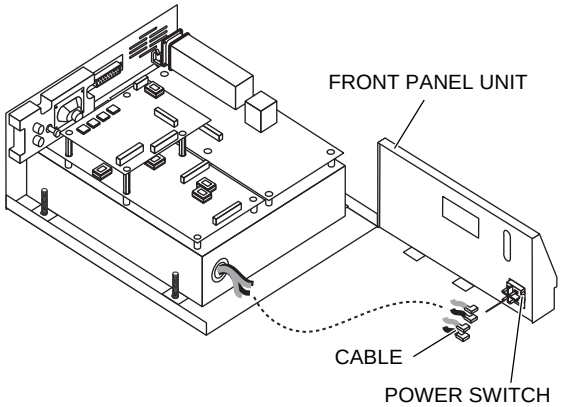


(4) Detach the E23 HARNESS from J7 of UPHF40SS00U (monitor board).



(5) Remove the 3 NUTS holding the FRONT PANEL UNIT (C6N3SZ) and detach the FRONT PANEL UNIT.

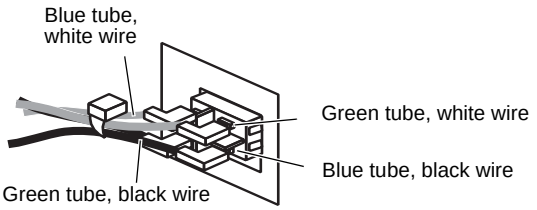
Box screwdriver (5.5 mm between opposite sides)

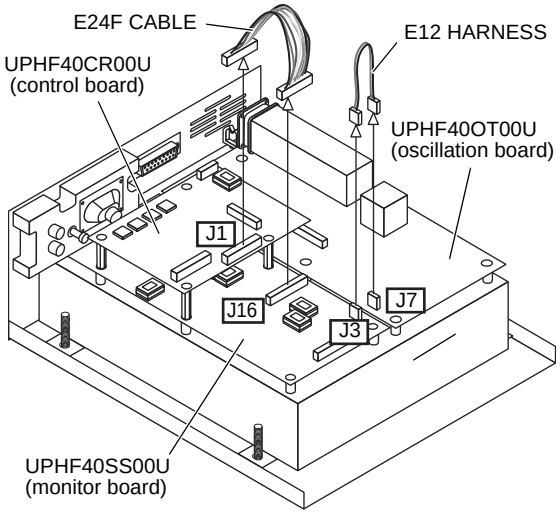


(6) Detach the CABLE from the POWER SWITCH, and then remove the FRONT PANEL UNIT.

Note: During reassembly, pay attention to the following items:

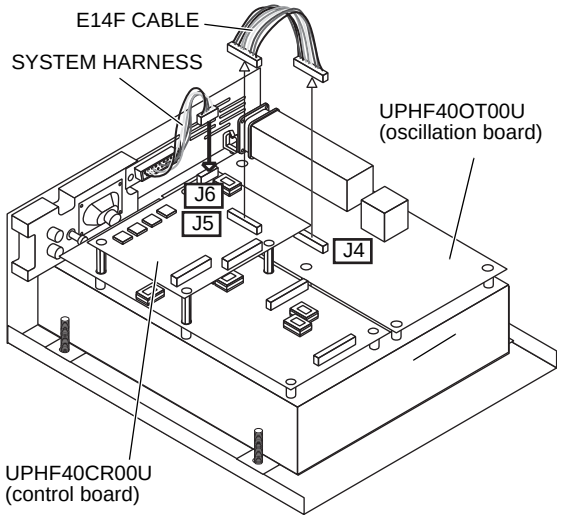
- Fully reinsert the CABLE into the POWER SWITCH.
- If the binder is removed during disassembly, bind the root of the CABLE for reassembly.





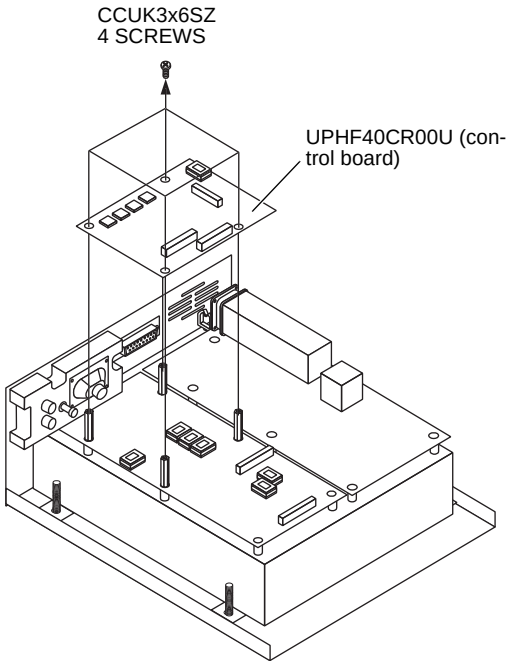
(7) Detach the E12 HARNESS from J3 of UPHF40SS00U (monitor board) and J7 of UPHF40OT00U (oscillation board).

(8) Detach the E24F CABLE from J1 of UPHF40CR00U (control board) and J16 of UPHF40SS00U (monitor board).



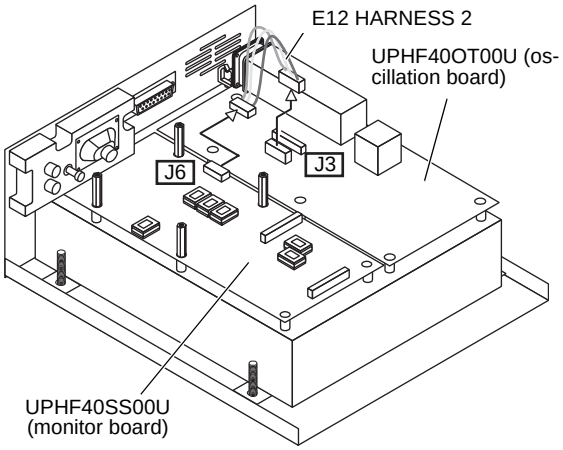
(9) Detach the E14F CABLE from J5 of UPHF40CR00U (control board) and J4 of UPHF40OT00U (oscillation board).

(10) Detach the SYSTEM HARNESS from J6 of UPHF40CR00U (control board).

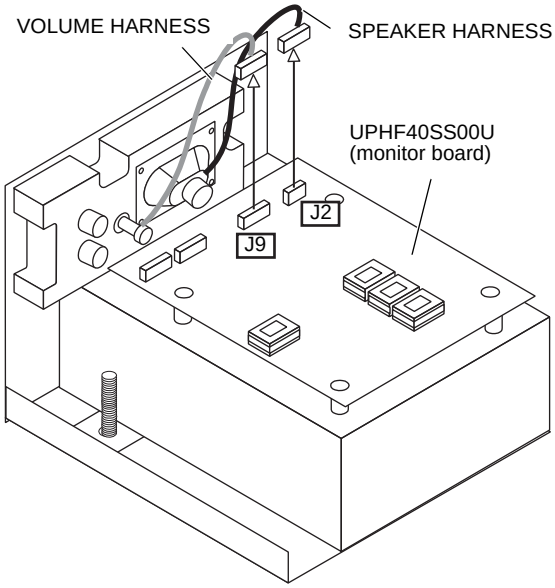


(11) Remove the 4 SCREWS (CCUK3x6SZ) holding UPHF40CR00U (control board), and detach UPHF40CR00U (control board).

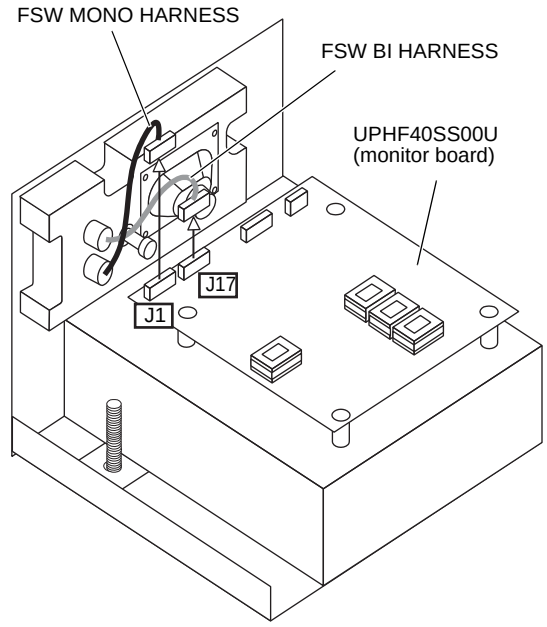
Phillips screwdriver (No. 2)



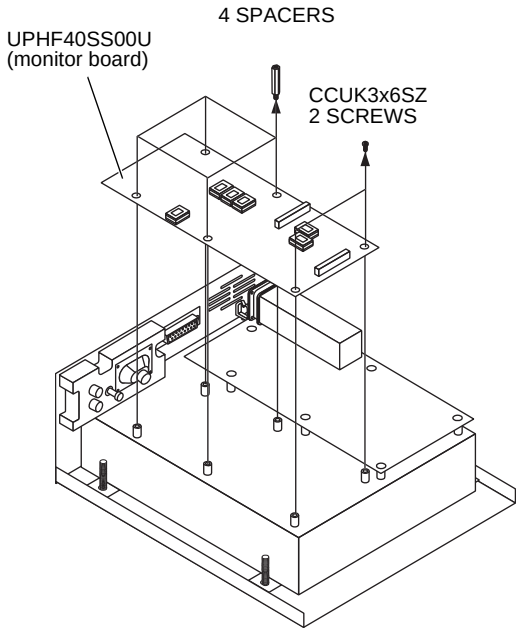
(12) Detach the E12 HARNESS 2 from J6 of UPHF40SS00U (monitor board) and J3 of UPHF40OT00U (oscillation board).



(13) Detach the VOLUME HARNESS from J9 of UPHF40SS00U (monitor board), and detach the SPEAKER HARNESS from J2 of UPHF40SS00U (monitor board).



(14) Detach the bottom FSW MONO HARNESS from J1 of UPHF40SS00U (monitor board) and the top FSW BI HARNESS from J17 of UPHF40SS00U (monitor board).

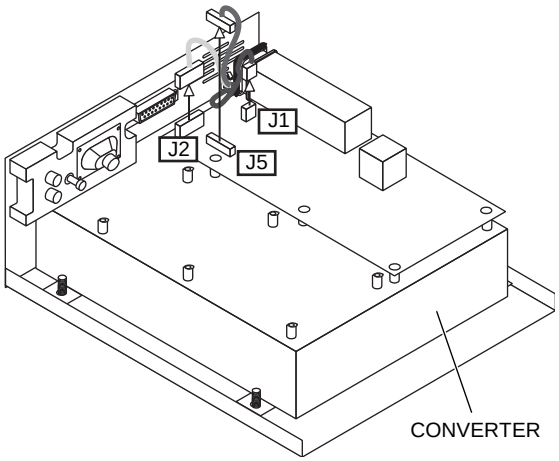


(15) Remove the 4 SPACERS between UPHF40CR00U (control board) and UPHF40SS00U (monitor board).

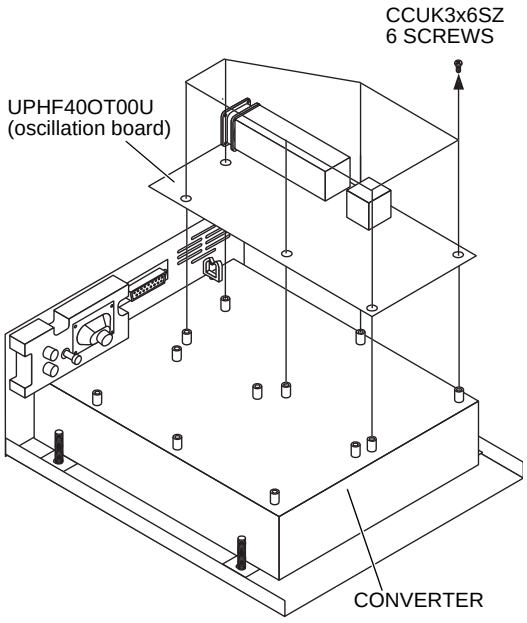
Box screwdriver (5.5 mm between opposite sides)

(16) Remove the 2 SCREWS (CCUK3x6SZ) holding UPHF40SS00U (monitor board), and remove UPHF40SS00U (monitor board).

Phillips screwdriver (No. 2)

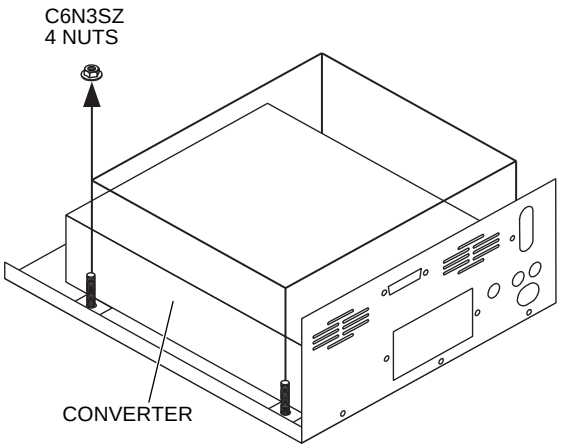


(17) Detach the CONVERTER HARNESS from UPHF40OT00U (oscillation board).
(Pin 3: J1; pin 6: J2; pin 9: J5)
Note: During reassembly, ensure that the HARNESS will not obstruct with the fan vent. In addition, make sure the CABLE is affixed to the clamp attached to the CONVERTER.



(18) Remove the 6 SCREWS (CCUK3x6SZ) holding UPHF40OT00U (oscillation board), and detach UPHF40OT00U (oscillation board).

Phillips screwdriver (No. 2)



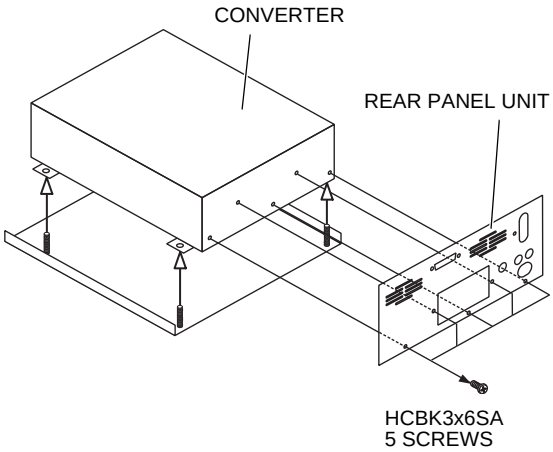
(19) Remove the 4 NUTS (C6N3SZ) holding the CONVERTER.

Box screwdriver (5.5 mm between opposite sides)

(20) Remove the 5 SCREWS (HCBK3x6SA) holding the REAR PANEL UNIT.

Phillips screwdriver (No. 2)

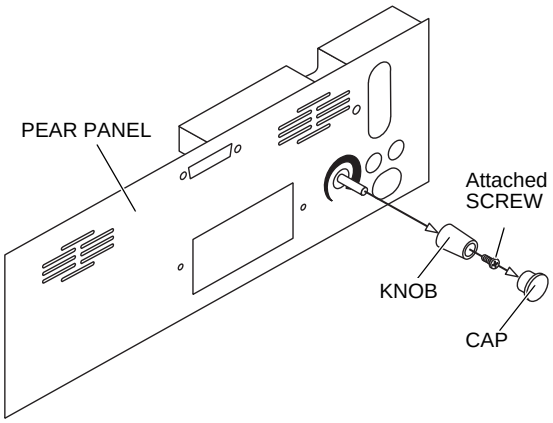
Note: During reassembly, ensure that the CONVERTER is in close contact with the REAR PANEL, with no gaps.



(21) Remove the CONVERTER and REAR PANEL UNIT.

Note: During reassembly, attach the REAR PANEL UNIT and CONVERTER before attaching the CHASSIS and CONVERTER.

2-2-2 REAR PANEL UNIT disassembly



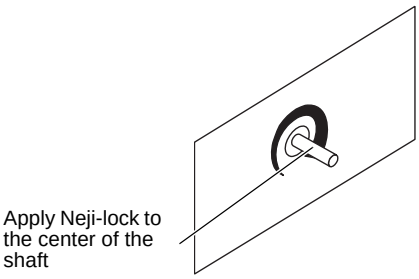
(1) Remove the CAP.

(2) Remove the single attached SCREW (for the VOLUME HARNESS) and remove the KNOB.

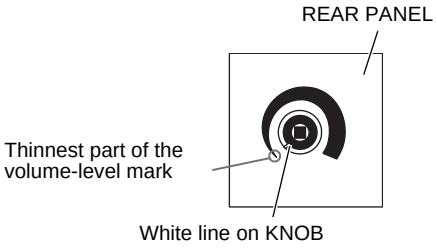
Phillips screwdriver (No. 1)
Neji-lock (during reassembly)

Note: During reassembly, pay attention to the following items.

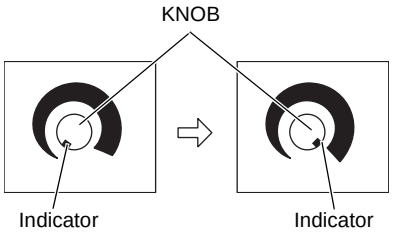
- Turn the shaft counterclockwise until it stops.
- Visually identify the center of the shaft, and apply Neji-lock.

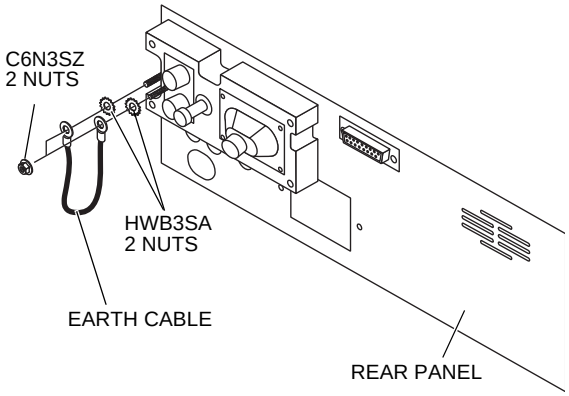


- Align the white line on the KNOB with the thinnest part of the volume-level mark printed on the REAR PANEL, and affix it using the SCREW.



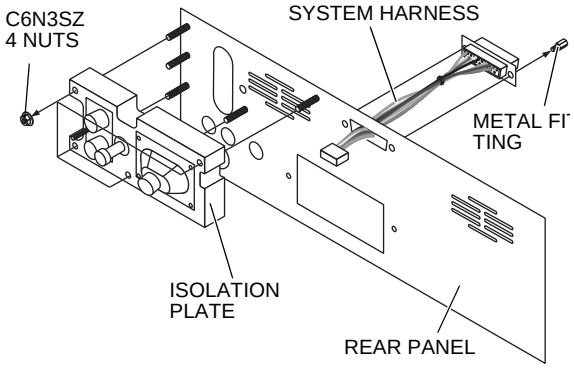
- Ensure that when the KNOB is turned, the CAP and KNOB indicator move to the positions shown below.





(3) Remove the 2 NUTS (C6N3SZ) and 2 WASHERS (HWB3SA) holding the EARTH CABLE, and remove the EARTH CABLE.

Box screwdriver (5.5 mm between opposite sides)



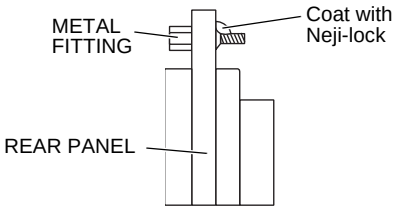
(4) Remove the 2 METAL FITTINGS holding the SYSTEM HARNESS, and remove the SYSTEM HARNESS.

Box screwdriver (5 mm between opposite sides)

Neji-lock (during reassembly)

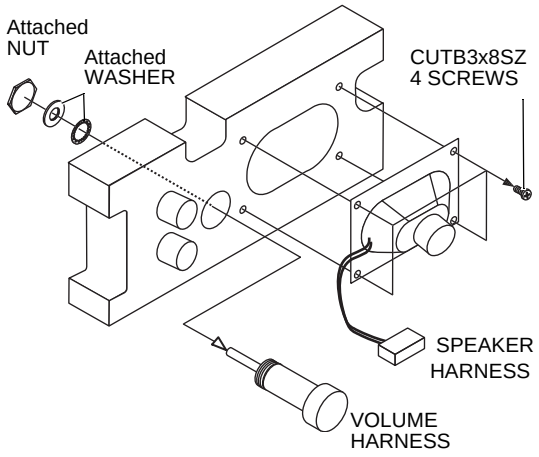
Note: During reassembly, apply Neji-lock to the 2 METAL FITTINGS as shown in the figure.

[Cross-sectional view]



(5) Remove the 4 NUTS (C6N3SZ) holding the ISOLATION PLATE, and remove the ISOLATION PLATE.

Box screwdriver (5.5 mm between opposite sides)

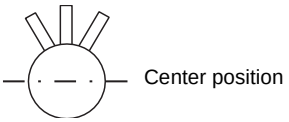


(6) Remove the attached NUT and 2 WASHERS holding the VOLUME HARNESS, and remove the VOLUME HARNESS.

Box screwdriver (8 mm between opposite sides)

Neji-lock (during reassembly)

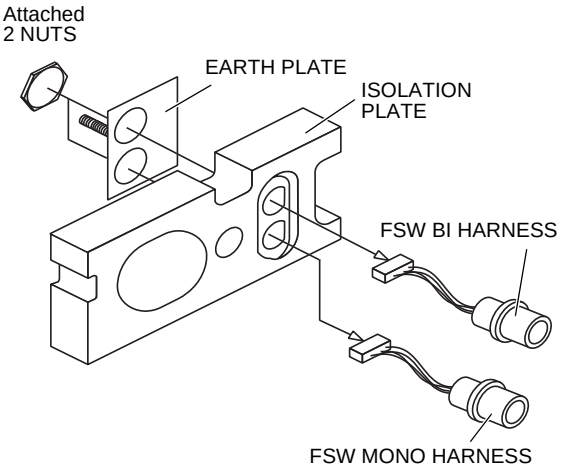
Note: During reassembly, apply Neji-lock to the HARNESS threads. When viewed from the position shown below, affix it so that the three harnesses attached to the VOLUME HARNESS faces up from the center position.



(7) Remove the 4 SCREWS (CUTB3x8SZ) holding the SPEAKER HARNESS.

Phillips screwdriver (No. 2)

Note: During reassembly, attach the harnesses attached to the SPEAKER HARNESS in the orientation shown in the figure to the left.



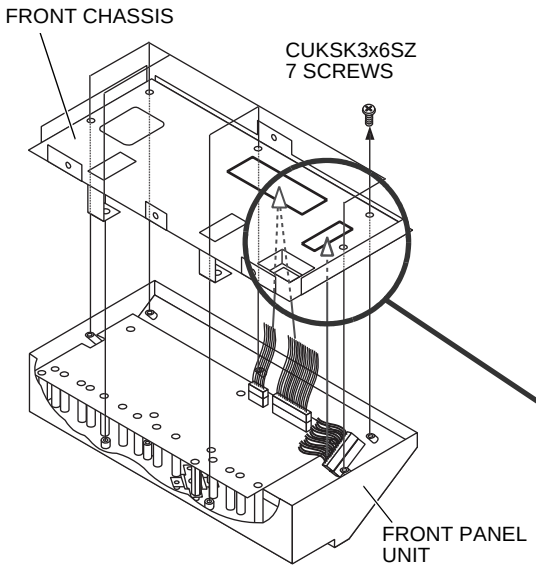
(8) Remove the 2 attached NUTS holding the FSW MONO HARNESS, FSW BI HARNESS, and EARTH PLATE, and remove the FSW MONO HARNESS and FSW BI HARNESS.

Wrench (19 mm between opposite sides)

Note: During reassembly, pay attention to the following items.

- Align the D cut of the foot-switch connector with the D cut of the ISOLATION PLATE, and attach them.
- Attach the FSW MONO HARNESS and FSW BI HARNESS in the proper position.
  FSW BI HARNESS: Pin 3 (top)
  FSW MONO HARNESS: Pin 5 (bottom)

2-2-3 FRONT PANEL UNIT disassembly



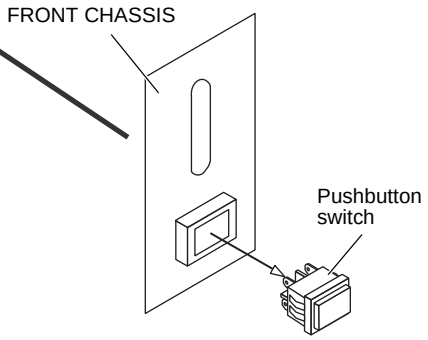
(1) Remove the 7 SCREWS (CUKSK3x6SZ) holding the FRONT CHASSIS, and remove the FRONT CHASSIS.

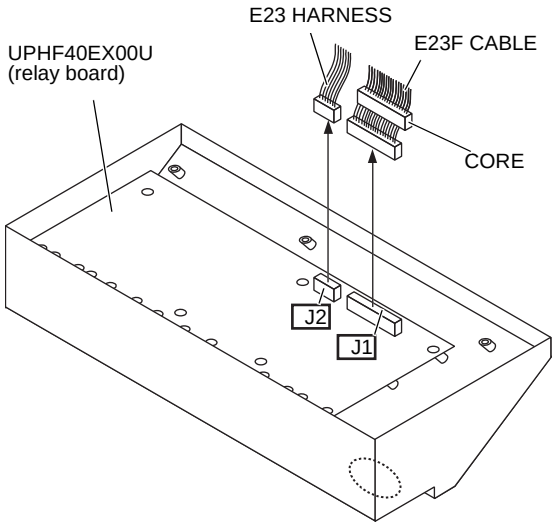
Phillips screwdriver (No. 2)

Note: During reassembly, thread each of the 3 HARNESSES through the FRONT CHASSIS holes.

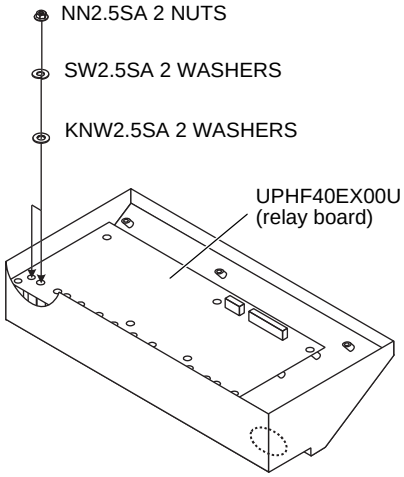
(2) Remove the pushbutton switch from the FRONT CHASSIS.

Note: During reassembly, insert the pushbutton switch until you feel a click.



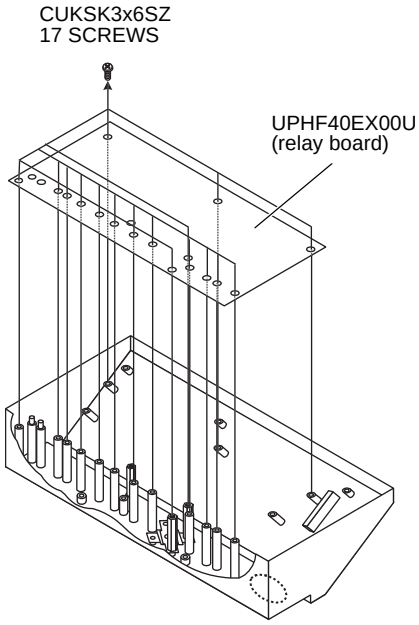


(3) Detach the E23 HARNESS from the J2 connector of UPHF40EX00U (relay board), and the E23F CABLE from the J1 connector.



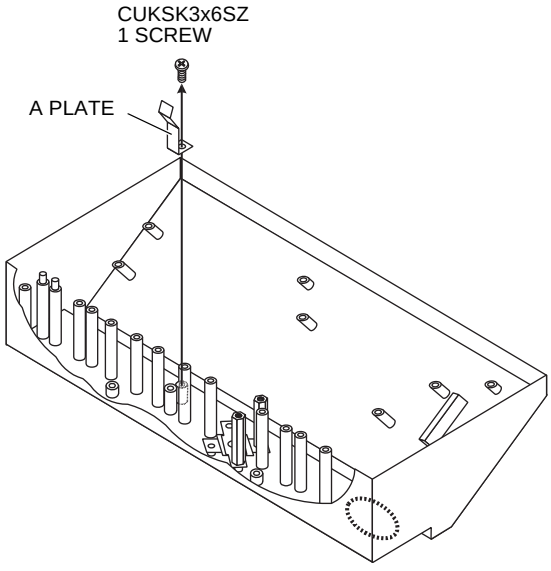
(4) Remove the 2 NUTS (NN2.5SA) and 4 WASHERS (2 WASHERS each of SW2.5SA and KNW2.5SA) holding UPHF40EX00U (relay board).

Box screwdriver (5 mm between opposite sides)



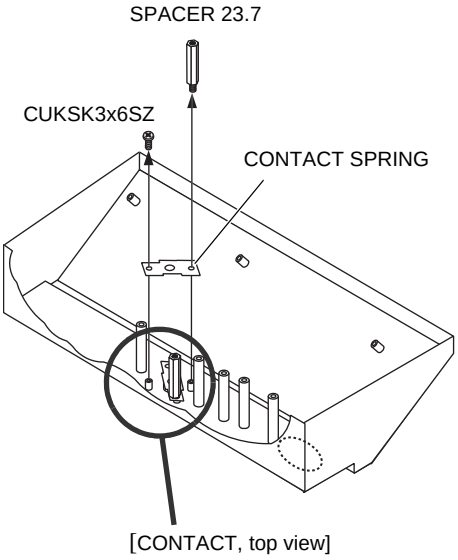
(5) Remove the 17 SCREWS (CUKSK3x6SZ) holding UPHF40EX00U (relay board), and remove the UPHF40EX00U (relay board).

Phillips screwdriver (No. 2)



(6) Remove the single SCREW (CUKSK3x6SZ) holding the A PLATE, and remove the A PLATE.

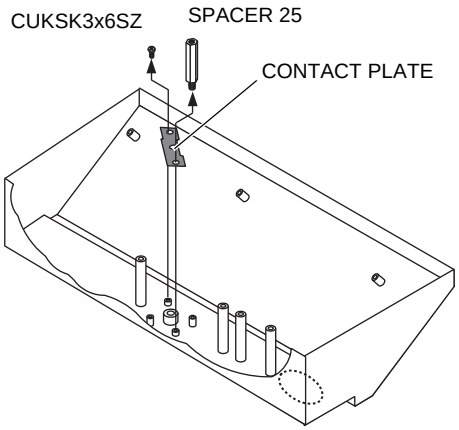
Phillips screwdriver (No. 2)

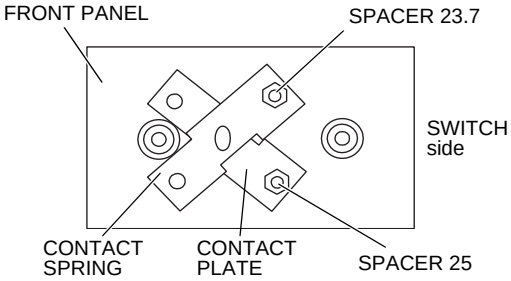


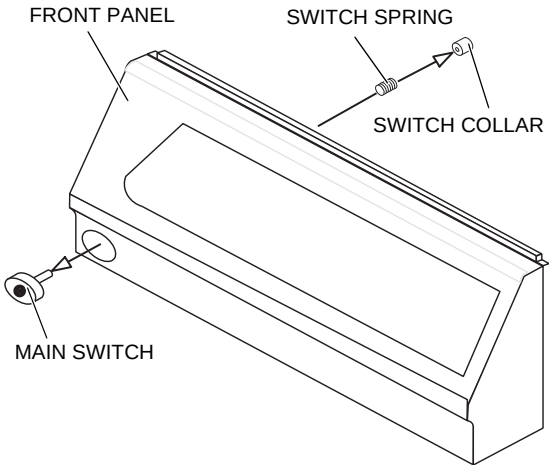
(7) Remove the 2 SCREWS (CUKSK3x6SZ), and then remove the SPACER 23.7, CONTACT SPRING, SPACER 25, and CONTACT PLATE (in that order).

Box screwdriver (5.5 mm between opposite sides)

Phillips screwdriver (No. 2)







(8) Remove the MAIN SWITCH, SWITCH SPRING, and SWITCH COLLAR.

3. Reassembly procedure

3-1 Tools

Please refer to “2-1 Tools.”

3-2 Reassembly procedure

To perform reassembly, reverse the disassembly procedure, referring to “2-2 Disassembly procedure.”
No adjustments such as positioning are required during reassembly.

Chapter 4:Inspection

1 Preparation 4-2
2 Inspection Procedure 4-2

1. Preparation

Prepare the following equipment for inspection.

Name	Model	Specifications	Remarks
Electrosurgical Analyzer	454A	–	DNI NEVADA INC.

2. Inspection Procedure

Connect the Electrosurgical Analyzer to the UES-40. (Refer to the Electrosurgical Analyzer instruction manual for details.)

Refer to the following table to check output values:

Table 4-1 Setting and output of each mode

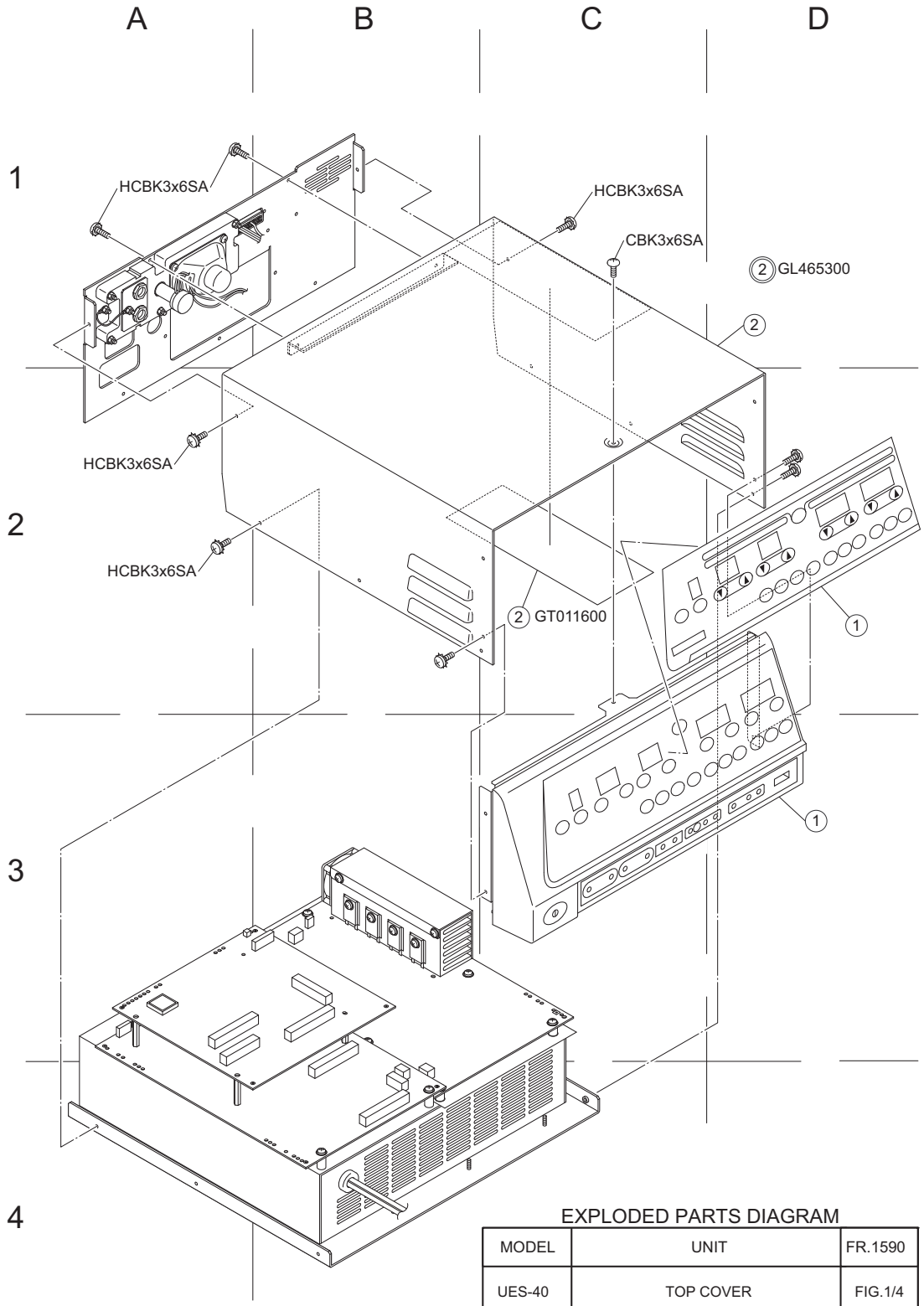
Output mode	Load resistance [¾]	UES-40 output setting [W]	Standard [W]
Monopolar Spray	200	60	48-72
Monopolar Coag. 1	300	60	48-72
Monopolar Coag. 2	300	60	48-72
Monopolar Blend	300	125	100-150
Monopolar Cut	300	150	120-180
Bipolar Soft1	100	45	36-54
Saline Blend	100	160	128-192

The above listed measurement points can cover all output specifications, because there are no difference other than the amplitude of waveform in each output mode.

Chapter 5: Parts List

1 Exploded Parts Diagram 5-2
2 Parts List..... 5-6

1. Exploded Parts Diagram



EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1590
UES-40	TOP COVER	FIG.1/4
OLYMPUS MEDICAL SYSTEMS CORP.		

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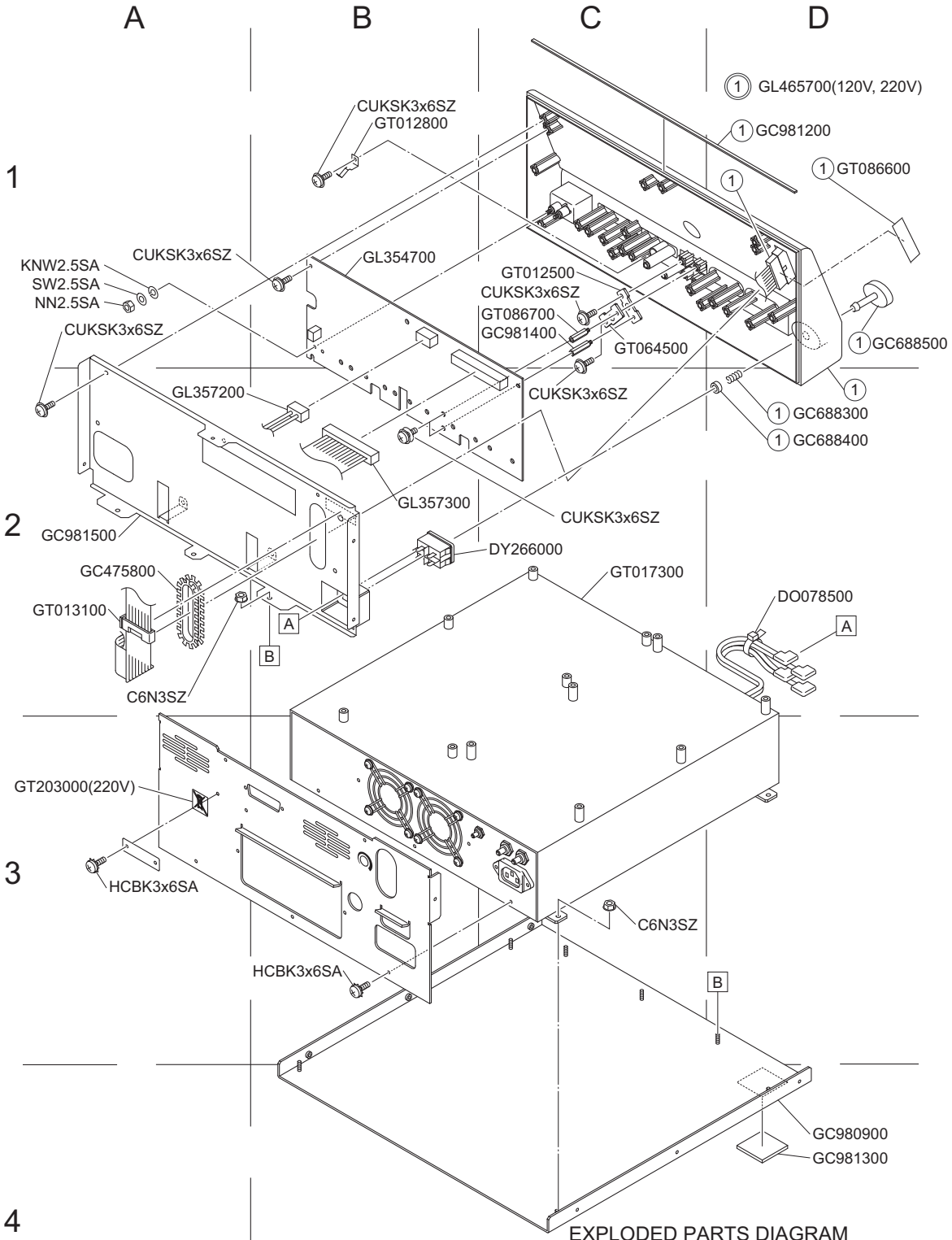

EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1590
UES-40	FRONT PANEL , CONVERTER	FIG.2/4
OLYMPUS MEDICAL SYSTEMS CORP.		

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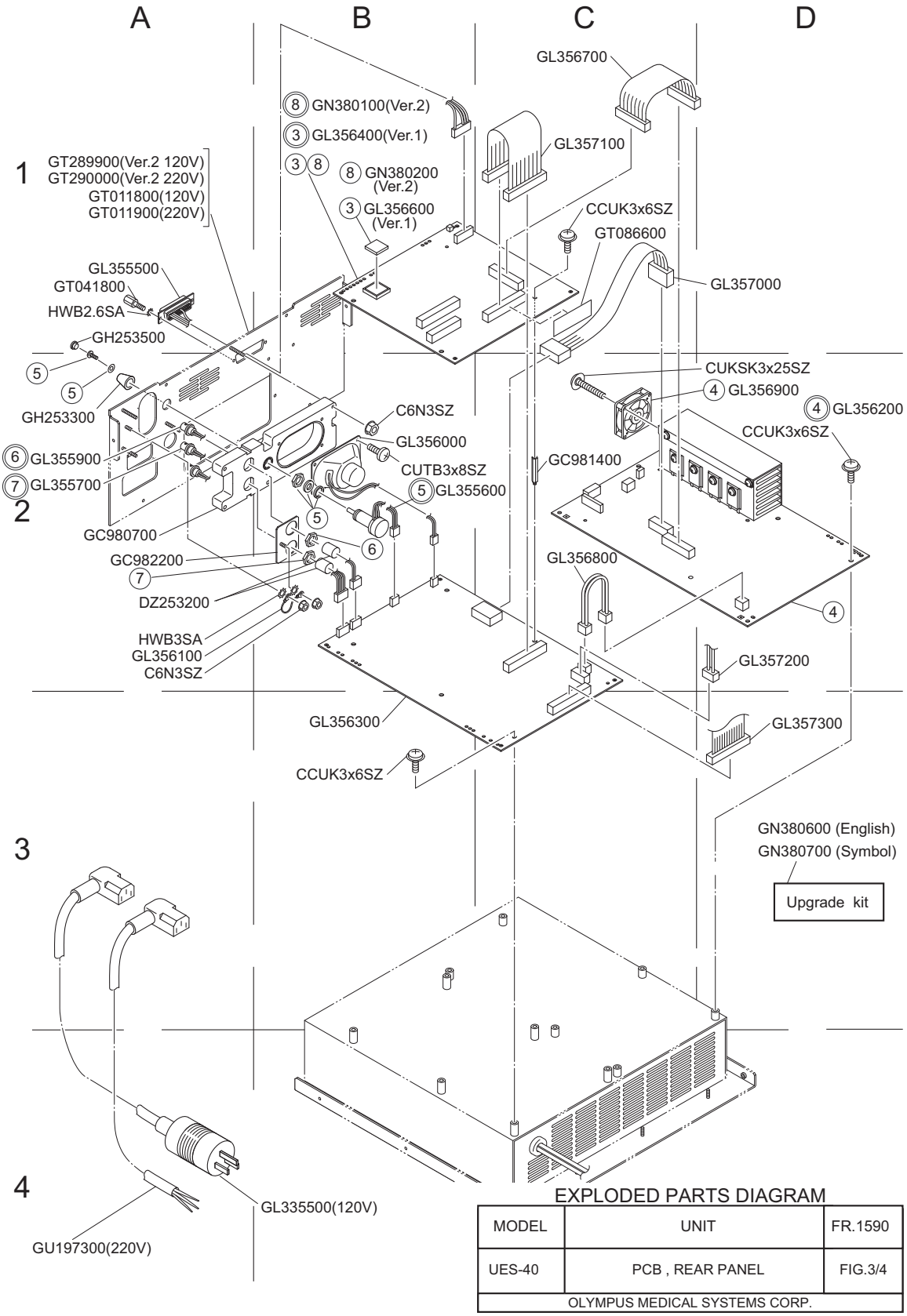

EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1590
UES-40	PCB , REAR PANEL	FIG.3/4
OLYMPUS MEDICAL SYSTEMS CORP.		

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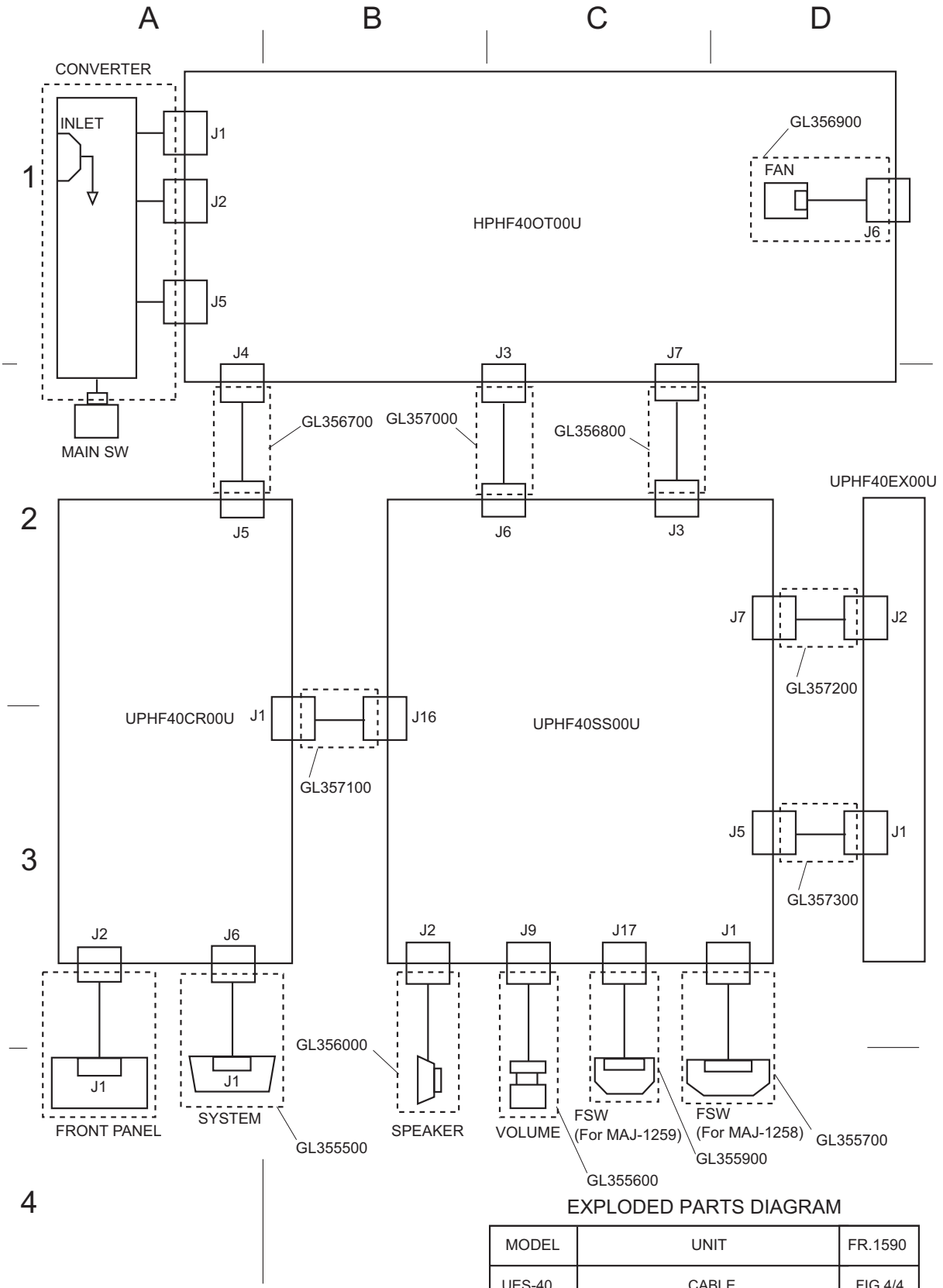

EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1590
UES-40	CABLE	FIG.4/4
OLYMPUS MEDICAL SYSTEMS CORP.		

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2. Parts List

PARTS No.	INDEX	PARTS NAME E.	SPECIFICATION	REMARK
DO078500	2-D2	BINDING WIRE		
DY266000	2-C2	SWITCH		
DZ253200	3-A2	FERRITE CORE		
GC475800	2-A2	BUSH 4		
GC688300	2-D2	SWITCH SPRING		
GC688400	2-D2	SWITCH COLLAR		
GC688500	2-D1	MAIN SWITCH		
GC980700	3-A2	ISOLATION PLATE		
GC980900	2-D4	CHASSIS		
GC981200	2-D1	F PACKING		
GC981300	2-D4	FOOT		
GC981400	2-C1	SPACER 25		
GC981500	2-A2	F CHASSIS		
GC982200	3-A2	GROUND PLATE		
GH253300	3-A2	KNOB		
GH253500	3-A1	CAP		
GL335500	3-B4	POWER CABLE OAU	120V	
GL354700	2-B1	UPHF40EX00U		RELAY PCB
GL355500	3-A1	SYSTEM HARNESS		
GL355600	3-B2	VOLUME HARNESS		
GL355700	3-A2	FSW MONO HARNESS		
GL355900	3-A2	FSW BI HARNESS		
GL356000	3-B2	SPEAKER HARNESS		
GL356100	3-A2	GROUND CABLE		
GL356200	3-D2	UPHF40OT00U		OSCILLATION
GL356300	3-B3	UPHF40SS00U		MONITOR PCB
GL356400	3-B1	UES40 CONTROL U		CONTROL PCB
GL356600	3-B1	UES40ROMU		
GL356700	3-C1	E14F HARNESS		
GL356800	3-C2	E12 HARNESS		
GL356900	3-D2	FAN HARNESS		
GL357000	3-D1	E12 HARNESS 2		
GL357100	3-C1	E24F HARNESS		
GL357200	2-A2	E23 HARNESS		
GL357300	2-B2	E23F HARNESS		
GL465300	1-D1	TOP COVER U		
GL465700	2-D1	PANEL EU	120V, 220V	
GN380100	3-B1	UES40 V2 CONTOL U	Ver.2	
GN380200	3-B1	UES40 V2 ROM U	Ver.2	

PARTS No.	INDEX	PARTS NAME E.	SPECIFICATION	REMARK
GN380600	3-D3	VER2 SET-E	Ver.2 English	
GN380700	3-D3	VER2 SET-S	Ver.2 Symbol	
GT011600	1-C2	MYLAR T		
GT011800	3-A1	REAR PANEL E	120V	
GT011900	3-A1	REAR PANEL S	220V	
GT012500	2-C1	CONTACT PLATE		
GT012800	2-B1	A CORD PLATE		
GT013100	2-A2	CABLE CLAMP		
GT017300	2-C2	CONVERTER		
GT041800	3-A1	METAL FITTING		
GT064500	2-C1	CONTACT SPRING		
GT086600	2-D1	MYLAR C		
GT086700	2-C1	SPACER23.7		
GT203000	2-A3	WEEE MARK	220V	
GT289900	3-A1	REAR PANEL E	Ver.2 120V	
GT290000	3-A1	REAR PANEL S	Ver.2 220V	
GU197300	3-A4	POWER CABLE 2U	220V	
C6N3SZ	2-A2	NUT		
CBK3x6SA	1-C1	SCREW		
CCUK3x6SZ	3-B3	SCREW		
CUKSK3x25SZ	3-D2	SCREW		
CUKSK3x6SZ	2-A1	SCREW		
CUTB3x8SZ	3-B2	SCREW		
HCBK3x6SA	1-A1	SCREW		
HWB2.6SA	3-A1	WASHER		
HWB3SA	3-A2	WASHER		
KNW2.5SA	2-A1	WASHER		
NN2.5SA	2-A1	NUT		
SW2.5SA	2-A1	WASHER		

OLYMPUS®

OLYMPUS MEDICAL SYSTEMS CORP.
2951 Ishikawa-cho, Hachioji-shi, Tokyo Japan

Service Engineering
Medical Service Engineering Depertment
Production and Service Division

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